Alameda Countywide
Clean Water Program

Contra Costa
Clean Water Program

Fairfield-Suisun
Urban Runoff
Management Program

Marin County
Stormwater Pollution
Prevention Program

Napa County
Stormwater Pollution
Prevention Program

San Mateo Countywide
Water Pollution
Prevention Program

Santa Clara Valley
Urban Runoff Pollution
Prevention Program

Sonoma County
Water Agency

Vallejo Sanitation
and Flood
Control District

BASMAA

To Whom It May Concern:

We certify under penalty of law that this document was prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

James Scanlin, Alameda Countywide Clean Water Program

Tom Dalziel, Contra Costa Clean Water Program

Kevin Cullen, Fairfield-Suisun Urban Runoff Management Program

Matt Fabry, San Mateo Countywide Water Pollution Prevention Program

Adam Olivieri, Santa Clara Valley Urban Runoff Pollution Prevention Program

Lance Barnett, Vallejo Sanitation and Flood Control District

Bay Area

Stormwater Management

Agencies Association

P.O. Box 2385

Menlo Park, CA 94026

510.622.2326

info@basmaa.org

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Regional Pollutants of Concern Report for FY 2011-2012

and

Regional Monitoring Coalition Monitoring Status Report for February-June 2012

September 11, 2012 *

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Agencies Association

P.O. Box 2385

Menlo Park, CA 94026

510.622.2326

info@basmaa.org

* Typographical corrections made to file submitted September 17, 2012 – see pages iv and 56.

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INTRODUCTION

This document is divided into two main parts, each serving a different purpose. Part A, the **Regional Pollutants of Concern Report** for FY 2011-2012 (Regional POC Report), summarizes the status of regionally-implemented activities that were conducted on behalf of all 76 municipalities and special districts (Permittees) subject to the Municipal Regional Stormwater NPDES Permit (MRP, Order R2009-0074) issued by the San Francisco Regional Water Quality Control Board (Water Board). The Regional POC Report covers annual reporting requirements for portions of MRP Provisions C.9, C.11, C.12, C.13 and C.14, and also reports on the status of regional activities implemented in compliance with Provision C.10.a. The Regional POC Report complements separately submitted Annual Reports prepared by Permittees individually or by their respective countywide stormwater programs.

Part B of this document is a **Monitoring Status Report** that provides an update on activities related to MRP Provision C.8 (Water Quality Monitoring). As described in the introduction to the Status Report, the MRP does not require reporting for C.8 provisions until 2013, but Permittees have agreed to provide the Water Board with brief Monitoring Status Reports in March and September of 2011 and 2012 to demonstrate progress in water quality monitoring planning activities. This Monitoring Status Report covers activities roughly from the time period February through June 2012.

Regionally-implemented activities for Pollutants of Concern (POCs) and water quality monitoring are conducted under the auspices of the Bay Area Stormwater Management Agencies Association (BASMAA), a 501(c)(3) non-profit organization comprised of the municipal stormwater programs in the San Francisco Bay Area. Most of the MRP requirements pertinent to activities discussed in the Regional POC Report and Monitoring Status Report are met entirely by BASMAA regional projects, except where otherwise noted. Scopes, budgets, and contracting or in-kind project implementation mechanisms for BASMAA regional projects follow BASMAA's *Operational Policies and Procedures,* approved by the BASMAA Board of Directors (BOD). MRP Permittees, through their stormwater program representatives on the BOD and its subcommittees, collaboratively authorize and participate in BASMAA regional projects or tasks. Regional project costs are shared by either all BASMAA members or among those Phase I municipal stormwater programs that are subject to the MRP[1]. To conduct monitoring for the MRP as a regional collaborative, the BASMAA Regional Monitoring Coalition (RMC) was established in July 2010 to coordinate monitoring activities among BASMAA members and with other related monitoring initiatives.

[1] The BASMAA programs supporting MRP Regional Projects include all MRP Permittees as well as the cities of Antioch, Brentwood, and Oakley which are not named as Permittees under the MRP but have voluntarily elected to participate in MRP-related regional activities.

PART A

REGIONAL POLLUTANTS OF CONCERN REPORT

POLLUTANTS OF CONCERN

Provisions C.9 through C.14 of the MRP address pollutants that are identified as being of regulatory concern for the San Francisco Bay or other local water bodies. For some, regulatory water quality attainment strategies, such as Total Maximum Daily Loads (TMDLs), have been adopted or are currently under development.

For mercury, PCBs and other sediment-bound pollutants, the Water Board has proposed to require implementation of stormwater-related control measures in the following modes:

1. Full-scale implementation throughout the region.
2. Focused implementation in areas where benefits are most likely to accrue.
3. Pilot-testing in a few specific locations.
4. Other: This may refer to experimental control measures, Research and Development, desktop analysis, laboratory studies, and/or literature review.

Many regional tasks reported in this section focus on MRP provisions relating to modes 3 and 4, which require studies or pilot projects intended to reduce uncertainties about the sources, occurrence or effectiveness of control measures for POCs. Other tasks will be implemented through participation in regional or state-wide collaboratives, such as:

- The Regional Monitoring Program for Water Quality in the San Francisco Estuary (RMP), described in more detail in the Monitoring Status Report below; and
- initiatives to control sources of specific pollutants.

PESTICIDES TOXICITY CONTROL (C.9)

C.9.e. Track and Participate in Relevant Regulatory Processes

The essential requirements of this provision are to track U.S. Environmental Protection Agency (USEPA) and California Department of Pesticide Regulation (DPR) actions related to urban-uses of pesticides and actively participate in the shaping of regulatory efforts currently underway. This provision allows for cooperation among Permittees through the California Stormwater Quality Association (CASQA), BASMAA and/or the Urban Pesticide Pollution Prevention Project (UP3 Project). Recognizing that this approach is the most likely to result in meaningful changes in the regulatory environment, Permittees elected to continue on this course in FY 2011-12 to achieve compliance with this provision. Oversight of this provision is the purview of the BASMAA Board of Directors.

Summary of participation efforts
The actual work of tracking and participating in the ongoing regulatory efforts related to pesticides was accomplished through CASQA. CASQA conducted its activities on behalf of members and coordinated funding contributions and activities through its Pesticides Subcommittee, a group of stormwater quality agencies affected by pesticides or pesticides-related toxicity listings, TMDLs, or permit requirements, as well as others knowledgeable about pesticide-related stormwater issues. One of the Subcommittee's two co-chairs is Jamison Crosby of the Contra Costa Clean Water Program (with Napa County Stormwater Pollution Prevention Program starting in FY 2012-13).

With funding collected from numerous California urban runoff programs and municipal wastewater treatment plant organizations, CASQA conducts the following activities:

- Track pesticide-related regulatory activities by USEPA, DPR, and other agencies that have significant potential to affect municipal wastewater treatment plants, municipal urban runoff programs, and surface water quality.
- Maintain open lines of communication with pesticide regulators, water board and other allies, pesticide manufacturers, professional pesticide applicators, and other key stakeholders.
- Identify highest priority pesticides-related regulatory activities.
- Obtain and review relevant new scientific information.
- Identify anticipated affect on municipal urban runoff programs and surface water quality.
- For priority items, analyze regulatory documents like environmental risk assessments, obtain related scientific information, and hold meeting and/or write comment letters regarding proposed actions and CASQA and the clean water community's concerns.
- As necessary, develop and analyze background information, such as pesticide use information, identification of priority pesticides, or data summaries on new pesticides, to inform management decisions or to document the scientific basis for a requested regulatory action.

Information Submitted and How Regulatory Actions Were Affected
FY 2011-12 was very productive. Table A.1 summarizes information submitted and how regulatory actions were affected. The participation efforts listed above produced outcomes at Outcome Level 3: Target Audience Actions (formerly Behavior Change) in the CASQA Effectiveness Assessment system.

C.9.g. Evaluate Implementation of Source Control Actions Relating to Pesticides

There are no Annual Reporting requirements for Provision C.9.g in FY 2011-12. In the FY2012-13 Annual Report, additional information will be provided on the status of implementation activities designed to comply with this provision.

Table A.1. Stormwater Programs' Pesticide Regulatory Process Participation and Outcomes in 2012

Outcome in 2012	CASQA Participation Actions*
A.1.1 Adoption of California regulations, "Surface Water Protection in Outdoor Nonagricultural Settings." Regulations were completed in June 2012 and became effective July 19, 2012. The regulations reduce the quantities of pyrethroids applied on outdoor impervious surfaces by professional applicators, thus reducing the quantity of pyrethroids that can be washed directly into gutters and storm drains when it rains or when water like irrigation overflow runs across treated surfaces. Together, the regulations and new bifenthrin labeling (see below) are anticipated to reduce the amount of pyrethroid insecticides in urban stormwater runoff by 80-90%.[2] UP3 Project analysis—based on pyrethroid monitoring data, pyrethroid use data, and urban runoff modeling by U.C. Davis—suggests that the regulations (in combination with label changes described below) will largely, but not completely, end widespread water and sediment toxicity from pyrethroids in San Francisco Bay Area urban watersheds. In some watersheds, lower levels of toxicity may continue. In a larger number of watersheds, pyrethroid concentrations will continue to exceed aquatic life protection benchmarks such as the values developed by U.C. Davis with funding from the Central Valley Water Board.	Letter to DPR 12/12/11** Since the early-2000s, multiple meetings, letters, and ongoing communications with California DPR.

*The San Francisco Bay Regional Water Quality Control Board also participated in almost all of these regulatory processes, providing input that paralleled CASQA's. The State Water Resources Control Board, the Central Valley Regional Water Quality Control Board, and California municipal wastewater treatment plants also joined CASQA and the San Francisco Bay Water Board in participating in many of these processes. Outcomes should be attributed to the combined communications of all participants.
**The table lists FY 2011/12 actions and summarizes past actions that relate directly to the outcome.

[2] Jorgenson, B. C. (2011). Off-Target Transport of Pyrethroid Insecticides in the Urban Environment: An Investigation into Factors Contributing to Washoff and Opportunities for Mitigation. Ph.D. Thesis, University of California, Davis.

Table A.1. Stormwater Programs' Pesticide Regulatory Process Participation and Outcomes in 2012 (continued)

Outcome in 2012	CASQA Participation Actions*
A.1.2 California Professional Bifenthrin Product Application Limitations Implemented through Product Label Changes. DPR agreed with water quality agencies that additional reductions in outdoor bifenthrin use—beyond what is required in the surface water regulations—are warranted because of bifenthrin's significant contribution to aquatic toxicity. At manufacturers' request, DPR allowed bifenthrin-specific restrictions to be implemented through label changes on bifenthrin professional product labels rather than through bifenthrin-specific regulations. For professional applicators, restrictions on pesticide labels are enforceable. New bifenthrin labels will prohibit applications to any exposed horizontal impervious surface and any building wall that abuts impervious surfaces that drain to storm drains. In fall 2011, bifenthrin manufacturers set out a relatively rapid schedule for bringing the newly labeled products to the California marketplace by summer 2012. Manufacturers jointly committed to the label changes and the aggressive implementation schedule in a Memorandum of Agreement (MOA), which signed by all manufacturers of bifenthrin professional products. In a letter concurring with the MOA, DPR promised not to include special bifenthrin restrictions in its regulations if the MOA is implemented as promised. Available evidence indicates that the label changes are occurring as promised in the MOA. For example, in May 2012, FMC, the manufacturer of one of the most popular professional bifenthrin products announced that it was shipping products reflecting the new labeling.	Since the mid 2000s, multiple meetings and ongoing communications with California DPR about bifenthrin water pollution.

Table A.1. Stormwater Programs' Pesticide Regulatory Process Participation and Outcomes in 2012 (continued)

Outcome in 2012	CASQA Participation Actions*
A.1.3 Water Quality Protection Label Changes for All Types of Pyrethroid Products—Including Consumer Products—Start to Appear on Product Shelves But Are Being Implemented Slowly. In 2009, USEPA began working with pyrethroid manufacturers to modify pyrethroid product labels with instructions that provide additional water quality protections. The instructions direct users to apply only spot or "crack and crevice" treatments on impervious surfaces and contain other recommendations, such as to avoid applications when rain is forecast in the next 24 hours. USEPA required these changes for pyrethroids that went through re-registration (cypermethrin, permethrin, resmethrin, tetramethrin, sumithrin, and allethrins). For all other pyrethroids (e.g., bifenthrin, cyfluthrin, esfenvalerate), the changes are voluntary until Registration Reviews are completed late this decade. EPA's initial goal was to achieve 100% voluntary label changes and to approve both voluntary and mandatory label changes in 2010. The reality has fallen short of this goal. The first modified consumer product labels began appearing on retail shelves in fall 2011. In spring 2012, manufacturers started to ship professional products with the new labels. In May 2012, USEPA admitted that there is no current target implementation date for the new labels and that not all manufacturers are voluntarily making the label changes. DPR's adoption of the Surface Water Protection regulations was partially motivated by the delays and limited adoption of these product labels. Since DPR regulations can only address professional applicators, the USEPA label change program is the only effort underway to reduce pyrethroid water pollution from non-professional (consumer) products. For most of the pyrethroids linked to water pollution, non-professional use is relatively small. The exception is bifenthrin, for which non-professional use comprises about 20% of the market.[3]	Since the mid 2000s, multiple meetings and ongoing communications with California DPR and USEPA about pyrethroid insecticide water pollution and specific early mitigation actions, including product label language improvements. The label change process was initiated by DPR in response to October 2007 letters from CASQA and the Water Boards requesting early mitigation actions for pyrethroids in urban runoff.

[3] TDC Environmental (2010). Pesticides in Urban Runoff, Wastewater, and Surface Water: Annual Urban Pesticide Use Data Report 2010. Prepared for the San Francisco Estuary Partnership.

Table A.1. Stormwater Programs' Pesticide Regulatory Process Participation and Outcomes in 2012 (continued)

Outcome in 2012	CASQA Participation Actions*
A.1.4 DPR Incorporated Surface Water Into Registration Process for Most New Pesticide Chemicals Intended for Use Outdoors in Urban Areas. On September 16, 2011, DPR announced a formal procedure to ensure that pesticides with potential to pollute surface water will be identified when they enter DPR's registration process and will be routed to DPR's Surface Water Program for review. Past DPR registration process shortcomings have allowed at least one problem pesticide (fipronil) to slip through and have constrained the quality of DPR's evaluations. DPR's new procedure should identify most pesticides likely to be water quality problems (however, there are a few critical gaps in the program, such as swimming pool chemicals). When registration is approved, DPR will have the necessary scientific basis to require appropriate mitigation measures. In parallel, DPR has established procedures to create a surface water quality "watch list," to require analytical methods when it registers pesticides on this watch list, and to track usage and annually reevaluate its monitoring program to respond to changes in use of watch list pesticides. In July 2011, just as DPR was finalizing its procedure, DPR demonstrated how the new process would work when it denied the application to register a product called Abtech Smart Sponge. The "Smart Sponge" is designed to kill bacteria in storm drains with a biocide that may also be toxic to aquatic organisms. Although USEPA's Antimicrobials Division gave minimal review of water quality implications when approving this product, DPR (in an early implementation of its new procedure) ensured that the product was fully reviewed by DPR's Surface Water Program. Because DPR Surface Water Program reviewers determined that there was insufficient information available to determine if the product would adversely impact water quality, DPR denied the registration application.	Since the early 2000s, multiple meetings, letters, and ongoing communications with California DPR.

Table A.1. Stormwater Programs' Pesticide Regulatory Process Participation and Outcomes in 2012 (continued)

Outcome in 2012	CASQA Participation Actions*
A.1.5 USEPAFormally Proposed Pesticides-Water Common Effects Assessment Methodologies, Obtains Scientific Review, and Takes Other Steps Toward Pesticides-Water Harmonization. Several years ago, California input to USEPA (in combination with input from a few other states) caused USEPA to initiate a cooperative effort between the Office of Water (OW) and the Office of Pesticide Programs (OPP) to "harmonize" EPA's approach to assessing the impacts of pesticides. This project has come to be called the "OPP/OW Common Effects Assessment Project." For the last two years, the focus of the project has been work on methods to develop numbers that are scientifically similar to water quality criteria, but are developed only with the data that are typically available for most pesticides (typically a much smaller aquatic toxicity data set than would be required to develop water quality criteria). USEPA published three white papers examining various facets of this topic, which it had peer reviewed by a Scientific Advisory Panel at the end of January 2012. EPA is reviewing the Science Advisory Panel's generally supportive report, which was finalized in May, and is determining its next steps toward implementation of a common effects assessment methodology. The joint project has already opened communication between OW and OPP and generated much greater cooperation between the two offices. For example, in summer 2011, OW and OPP published a joint procedure for evaluation of aquatic toxicity data.[4] For the first time, both offices will come to the same conclusion about data acceptability. Past OPP data acceptance procedures often precluded use of studies that were not generated by pesticide manufacturers.	National Association of Clean Water Agencies (NACWA) letter to USEPA (supported by CASQA scientific work) 3/8/12 Mentioned in nearly every comment letter to USEPA about pesticide Registration Review Since 1999, letters, workshop testimony, and multiple informal meetings and telephone calls with EPA.

[4] Brady, D. Director, Environmental Fate and Effects Division, Office of Pesticide Programs, U.S. USEPA (2011). "Evaluation Guidelines for Ecological Toxicity Data in the Open Literature." Memorandum to All Managers and Staff of the Environmental Fate and Effects Division.

Table A.1. Stormwater Programs' Pesticide Regulatory Process Participation and Outcomes in 2012 (continued)

Outcome in 2012	CASQA Participation Actions*
A.1.6 DPR and USEPA to Improve Ability to Model Pesticides in Urban Runoff. California input to USEPA and DPR has long encouraged development of modeling methods that USEPA and DPR can use to evaluate water quality risks associated with pesticide use in urban areas. In 2011, U.S. USEPA formalized plans to modify its pesticide runoff model (PRSM/EXAMS) to account for both pervious and impervious surfaces, to use washoff data, and to develop multiple urban modeling scenarios. In late 2011, DPR initiated a project to fill a key gap in urban runoff modeling by developing a computational model for pesticide wash-off from impervious surfaces. In June 2012, DPR provided funding to U.C. Davis to extend an existing pesticide environmental fate and transport model (HYDRUS 2/3D) to address urban runoff. Developing these improved models will help protect water quality because DPR and USEPA will be better able to predict water pollution before it occurs.	Since the early-2000s, multiple meetings, letters, and ongoing communications with USEPA and DPR about the need for predictive modeling tools to inform pesticide registration decisions.
A.1.7 USEPA Modified Fipronil Registration Review Work Plan. California agencies jointly requested that USEPA revise its preliminary work plan for fipronil registration review, which did not address urban fipronil use. The input to USEPA included specific recommendations for work plan improvements to evaluate urban fipronil uses that may entail releases into urban runoff, descriptions of the details of urban fipronil urban use, information about fipronil sources and pathways to urban runoff and surface waters, an explanation of the regulatory consequences and costs of pesticide water pollution, and a summary of fipronil monitoring data that documents increasing concentrations that are reaching levels that are toxic to sensitive aquatic organisms. In response, USEPA committed to modifying its fipronil Registration Review work plan to adopt the data requirements and review process that USEPA is using for the pyrethroids. In addition, USEPA intends to assess the cumulative impacts of fipronil's three major toxic degradates.	Teleconference meeting with USEPA 8/18/11; letter to EPA, including monitoring data summary, 8/29/11
A.1.8 USEPA Modified Permethrin Registration Review Work Plan. California agencies jointly supported EPA's general approach for permethrin registration review, while requesting improvements related to the urban runoff assessment. USEPA modified the work plan to improve the watershed modeling approach and committed to consider exposure time frames through the effort to integrate assessment methods with USEPA Office of Water.	Letter to USEPA 8/29/11

Table A.1. Stormwater Programs' Pesticide Regulatory Process Participation and Outcomes in 2012 (continued)

Outcome in 2012	CASQA Participation Actions*
A.1.9 USEPA Modified Spinosad Registration Review Work Plan. California agencies jointly requested that USEPA revise its preliminary work plan for Spinosad registration review, which did not address urban spinosad use. Spinosad, an alternative to pyrethroids, is highly toxic to aquatic organisms and has toxic and persistent degradates. The input to USEPA included specific recommendations for work plan improvements to evaluate urban spinosad uses that may entail releases into urban runoff. USEPA modified the work plan to include urban uses, to explicitly address impervious surfaces, and to add an evaluation of applications in storm drain catch basins.	Letter to USEPA 11/29/11
A.1.10 USEPA Modified Imiprothrin Registration Review Work Plan. California agencies jointly requested that USEPA revise its preliminary work plan for imiprothrin registration review, which did not fully address urban imiprothrin use. Imiprothrin is a pyrethroid insecticide that currently has a limited market share. USEPA modified the work plan to explicitly address impervious surfaces and to change aquatic toxicity data requirements such that they are more complete and consistent with requirements for other pyrethroids.	Letter to USEPA 11/29/11
A.1.11 USEPA Did Not Modify Sumithrin (d-Phenothrin) Registration Review Work Plan. California agencies jointly requested that USEPA revise its preliminary work plan for Sumithrin registration review to improve urban runoff related risk assessment methodologies. EPA's responses, which were inconsistent with past commitments, clarified the need to work more broadly with USEPA address methodologies for evaluating the water quality risk associated with outdoor urban pesticide use.	Letter to USEPA 2/21/12
A.1.12 USEPA Proposed Special Regulation of Nanoparticle Pesticides. In fall 2011, USEPA proposed a policy for regulating nanoparticle pesticides based on a rebuttable presumption that nanoparticles are different than the non-nanoparticle versions of the same pesticide. Requiring separate registration of nanoparticle pesticides would provide U.S. USEPA with the ability to obtain data to characterize their potential water quality impacts. USEPA is currently considering public comments on the proposed policy, but has signaled its intent to regulate nanoparticle pesticides separately through product-specific decisions on nanosilver pesticides.	Letter to USEPA 8/17/11

Table A.1. Stormwater Programs' Pesticide Regulatory Process Participation and Outcomes in 2012 (continued)

Outcome in 2012	CASQA Participation Actions*
A.1.13 DPR Will Evaluate Water Quality Risks from Proposed Silver-Containing Biocide Paint Before Making a Registration Decision. In November 2011, DPR announced its receipt of an application to register a product called Bactiblock 101, which is a silver-containing paint that product educational materials imply contains nanosilver. Comments requested a careful evaluation of the potential water quality risks associated with all proposed urban uses. The request was successful; DPR routed the application to its Surface Water program for review and will consider urban runoff and POTW discharges. DPR is currently reviewing the registration application.	Letter to DPR from Sacramento County, (supported by CASQA scientific work) 12/8/11
A.1.14 USEPA Begins Public Notification and Comment Period for Pesticide Registration Decisions. In March 2012, due in part to California communications—particularly input (completed jointly with NACWA) on the poor public notification process for the first nanosilver pesticide registration—EPA established the first-ever process to provide public notice and public input on pesticide registration decisions. Although USEPA will offer only a 30-day comment period, agencies will be able to access USEPA water quality risk assessments and will have the opportunity to offer information and guidance to address deficiencies. In the past, USEPA announced registration applications, but not decisions.	Since the late 1990s, multiple meetings and ongoing communications with USEPA expressing interest in providing information related to new pesticide registration decisions.
A.1.15 Pyrethroids Reevaluation – DPR Required the Pyrethroid Working Group (PWG) to Conduct an Urban Runoff "Pathways" Study. In summer 2011, DPR directed PWG to proceed with a small number of field-scale measurements of pyrethroids in urban runoff from single-family home facades with idealized landscaping. CASQA questioned the scientific value of the study and advised DPR to prioritize other activities. According to a May 2012 PWG progress report, the PWG's experiments, which compared pyrethroid washoff from pervious and impervious surfaces around the model facades, measured the greatest reductions in pyrethroid levels in runoff when the quantities applied on directly connected impervious surfaces were reduced.	Letter to DPR in 2010

Table A.1. Stormwater Programs' Pesticide Regulatory Process Participation and Outcomes in 2012 (continued)

Outcome in 2012	CASQA Participation Actions*
A.1.16 Application to Register Potential Pyrethroid Substitute Cyantraniliprole – Based on the limited information in EPA's and DPR's registration application public notices, it appears that cyantraniliprole could substitute for pyrethroids, and thereby could potentially see widespread use in urban areas if USEPA and DPR register it. Although there are no publicly available aquatic toxicity data for cyantraniliprole, a related chemical, (chlorantraniliprole) is very highly toxic to aquatic invertebrates and has multiple stable (and similarly toxic) degradates. Comments requested a careful evaluation of the potential water quality risks associated with all proposed urban uses of this new insecticide. Both USEPA and DPR are currently reviewing the registration application.	Letter to DPR 9/30/11; Letter to USEPA 3/26/12
A.1.17 Other Comments Were Submitted and Are Awaiting Responses. USEPA is currently considering public comments and revising its Registration Review work plans for: • Cypermethrin (a pyrethroid that is commonly detected in urban creeks) • Chlorothalonil (a fungicide that contains dioxins and hexachlorobenzene)	Two Letters to USEPA on 5/29/12

TRASH LOAD REDUCTION (C.10)

The goal of MRP Provision C.10 (Trash Load Reduction) is to implement control measures and other actions to significantly reduce trash loads to local urban creeks by the end of the term of the MRP (i.e., 40 percent by July 1, 2014), which will set the course for additional load reductions in future years. To achieve this goal, Permittees are required to develop and implement a Short-Term Trash Loading Reduction Plan, which includes the installation and maintenance of trash full-capture devices, designed to treat a mandatory minimum level of land area, and the implementation of other control measures and best management practices to prevent or remove trash loads. To address longer-term goals of trash reduction, Permittees are required to develop a Long-Term Trash Loading Reduction Plan by February 1, 2014 in preparation for the next permit.

Activities associated with Provision C.10 requirements were conducted in FY 2011-12 directly by Permittees, and at the countywide stormwater program and regional levels on behalf of Permittees. Actions conducted by Permittees are documented in section C.10 of each Permittee's Annual Report Form. Regional projects are coordinated through the BASMAA Trash Committee, which includes participation by Bay Area stormwater program and Permittee staff, Water Board staff and other stakeholders (e.g., Save the Bay, Clean Water Action and USEPA Region 9). All regional project deliverables are developed under the direction of the BASMAA Trash Committee and are approved by the BASMAA Board of Directors (BOD) prior to finalization.

In FY 2011-12, the BASMAA Trash Committee continued implementing the following three regional projects on behalf of all MRP Permittees in compliance with MRP C.10 provisions:

- Model Short-Term Trash Loading Reduction Plan
- Preliminary Baseline Trash Generation Rates Project; and
- Trash Load Reduction Tracking Method.

A status summary for each BASMAA regional project is included in this section. Summaries are organized by MRP provision or by major heading (both marked in bold).

C.10.a.i Model Short-Term Trash Loading Reduction Plan

Provision C.10.a.i of the Municipal Regional Permit (MRP) requires each Permittee to submit a Short-Term Trash Loading Reduction Plan (Short-Term Plan) to the Water Board by February 1, 2012. The Short-Term Plan must describe control measures and best management practices that are currently being implemented and the current level of implementation, and the planned new or enhanced control measures and best management practices that will be implemented to attain a 40 percent trash load reduction by July 1, 2014.

Model Short-Term Trash Loading Reduction Plan

Starting in late FY 2010-11, BASMAA began developing a *Draft Model Short-Term Trash Loading Reduction Plan* (Model Plan) to assist Permittees in complying with this requirement (C.10.a.i). The Model Plan provided Permittees with a template to use when they developed their own plans and created a consistent format among Permittees. A Draft Model Plan was released for comment by Permittees and Water Board staff in October 2011 and included model text descriptions and formats for reporting:

- Preliminary trash baseline loads;
- Baseline trash control measures implemented prior to the effective date of the MRP (12/1/09);
- Enhanced levels of trash control measure implementation expected to address the 40 percent trash load reduction goal; and
- Schedule for implementation of enhanced control measures.

The Model Plan was revised based on comments received and finalized by the BASMAA Trash Committee in December 2011.

Trash Load Reduction Calculator

The Model Plan includes a "Summary of Trash Control Measure Enhancements" as Section 5.0. To assist Permittees with estimating the predicted trash load reductions associated with the implementation of new and enhanced trash control measures, BASMAA developed a Trash Load Reduction Calculator. The Calculator (e.g., Excel Spreadsheet) requires Permittees to input baseline trash loads and planned levels of new/enhanced control measure implementation to address the 40 percent trash load reduction goal. Estimated load reductions calculated by the calculator for each applicable control measure are consistent with the BASMAA *Trash Load Reduction Tracking Method* – version 1.0 (see description below).

C.10.a.ii Baseline Trash Load

MRP Provision C.10.a.ii requires Permittees to develop and report on baseline trash loads from their MS4s by February 1, 2012. On February 1, 2011, BASMAA submitted a progress report to the Water Board on behalf of all towns, cities, and counties (i.e., Permittees) subject to this provision of the MRP. Through the submittal of this progress report, all MRP Permittees agreed to use methods developed collaboratively through BASMAA to develop their baseline trash load. These methods are fully described in the *Baseline Trash Loading Rates Literature Review and Methodology – Technical Memorandum* and the *Baseline Trash Loading Rates Sampling and Analysis Plan*.

Preliminary baseline trash loading estimates were developed and submitted by each Permittee in Section 2.0 of their Short-Term Plans. Preliminary baseline loads were developed consistent with the *Preliminary Baseline Trash Generation Rates* developed via a BASMAA regional project.

Preliminary generation rates were developed by monitoring trash at 159 sites located in four Bay Area counties (Alameda, Contra Costa, San Mateo and Santa Clara). Each site was a storm drain inlet that was equipped with Water Board recognized trash full capture device. Monitoring sites were selected to test the effect that land use and other factors (e.g., economic profile and population density) may have on trash loading rates.

The results from two monitoring events (May and September 2011) were used to develop the preliminary baseline generation rates submitted by BASMAA to the Water Board on February 1, 2012. These rates were used by each Permittee to develop preliminary baseline trash loads, which are specific to the jurisdictional areas for each Permittee and incorporate the effectiveness of baseline street sweeping and stormwater conveyance system maintenance programs.

Following the development of preliminary trash generation rates, two additional monitoring events were conducted in January and April 2012. The results of these events are currently being combined with the first two events to develop refined generation rates. Additionally, two hydrodynamic separators (HDS) devices were monitored to assist in calibrating refined trash generation rates. The HDS devices were located within larger heterogeneous land uses and income categories within the Cities of San Jose and Dublin.

A final technical report is currently under development and will be submitted in the fall of 2012 to the Water Board on behalf of all Permittees. The technical report will include final trash generation rates and describe all methods used and analyses conducted to develop the rates that will be used to develop Permittee baseline trash loads.

C.10.a.ii Trash Load Reduction Tracking Method

Provision C.10.a(ii) requires Permittees to develop a method by which they will demonstrate progress towards the MRP trash load reduction goal (i.e., 40 percent by 2014). On February 1, 2011, BASMAA submitted a progress report to the Water Board on behalf of all towns, cities, and counties (i.e., Permittees) subject to this MRP provision. Through the submittal of this progress report, all MRP Permittees agreed to use the load reduction tracking methods that will be developed collaboratively by BASMAA.

In FY 2010-11, the BASMAA BOD approved a regional project to develop load reduction tracking methods. As a first step, a list of trash control measures considered for implementation by Permittees was developed. These control measures formed the scope of a literature review that was conducted by BASMAA to document methods that were successfully used to assess effectiveness. After further consideration, MRP Permittees narrowed the list of trash control measures for which trash load reduction methods should be developed. This refined list of control measures was based on the potential for Permittees to implement; availability of information needed to show trash load reductions; and the expected benefit of implementation. Control measures were tentatively separated into two general types: 1) those for which quantification formulas could be created and, 2) those for which credits would need to be developed because quantification is likely not feasible (see Table A.2).

During FY 2011-12, Permittees continued discussing control measures at monthly BASMAA Trash Committee meetings. In August 2011, BASMAA distributed a first internal draft technical report of the load reduction tracking methodology which included quantification formulas and crediting methods for demonstrating trash load reductions. Revisions were made to the first draft report and a revised internal draft report was distributed to the BASMAA Trash Committee on October 10, 2011. As a courtesy, the revised internal draft report was distributed to Water Board staff. After review and incorporation of comments into the revised internal draft report, BASMAA distributed a revised draft technical report to BASMAA members and other interested stakeholders on November 11, 2011. Comments received on the draft technical report were incorporated into the final technical report. On February 1, 2012, BASMAA submitted the final technical report entitled *Trash Load Reduction Tracking Method: Assessing the Progress of San Francisco Bay Area MS4s Towards Stormwater Trash Load Reduction Goals – Version 1.0* to the Water Board (under BASMAA letterhead). This report fully describes the load reduction tracking method selected for each control measure, and the process by which load reduction tracking will take place. During FY 2012-13, BASMAA will be working with MRP Permittees to refine the Tracking Method.

Table A.2. Trash control measures for which load reduction credits or load reduction quantification formulas were developed to track progress towards trash load reduction goals.

Load Reduction Credit Control Measures
Single-use Carryout Plastic Bag Ordinances
Polystyrene Foam Food Service Ware Ordinances
Public Education and Outreach Programs
Activities to Reduce Trash from Uncovered Loads
Anti-Littering and Illegal Dumping Enforcement Activities
Improved Trash Bin/Container Management Activities
Single-use Food and Beverage Ware Ordinances
Quantification Formula Control Measures
On-land Trash Cleanups (Volunteer and/or Municipal)
Enhanced Street Sweeping
Partial-Capture Treatment Devices
Enhanced Storm Drain Inlet Maintenance
Full-Capture Treatment Devices
Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal)

JOINT MERCURY AND POLYCHLORINATED BIPHENYLS (PCBS) CONTROLS

Provisions C.11.c through Provision C.11.g for mercury are written identically to C.12.c through Provision C.12.g for PCBs. This reflects similarities between the respective TMDLs for these pollutants, based on the legacy and sediment-associated nature of their occurrence. For Provisions C.11/12.c through Provision C.11/12.f, MRP requirements focus on pilot studies (sites for these pilots were primarily chosen on the basis of the potential for reducing PCB loads, but consideration was given to mercury removal in

the final design and implementation of the studies). Provisions C.11.i and C.12.i are also written identically, since the primary San Francisco Bay beneficial use impairment for both mercury and PCBs is associated with consumption of fish containing these pollutants.

Overview of Mercury and PCB Pilot Projects

Provisions C.11/12.c through Provision C.11/12.f require pilot studies to test methods to reduce urban runoff loadings of PCBs and mercury to San Francisco Bay. These provisions require that Permittees pilot-test a variety of potential methods, including site remediation, enhancements of municipal operation and maintenance activities to remove sediments with pollutants, stormwater treatment retrofitting, and diversion of stormwater to existing Publicly-Owned Treatment Works (POTWs). Table A.3 summarizes the wide range of pollutant control methods that BASMAA agencies are pilot-testing. Figure A-1 shows the five project watersheds and 10 stormwater treatment retrofits, all of which are described later in this report. Most projects are located in the older industrial regions in the Bay Area where past studies have found elevated PCB and mercury concentrations in sediments collected from street and storm drain infrastructure. Thus the pilot projects, which are described in more detail later in this section, appear representative of the known types of potentially effective control measures and the geographic area of potential wider implementation in the future.

Integrated Monitoring Report - Part B

The MRP requires Permittees to submit an Integrated Monitoring Report (IMR) by March 14, 2014 that summarizes water quality monitoring activities and provides conclusions with regard to provisions C.8 and most of the C.11/12 pilot studies. BASMAA will assist Permittees in developing and submitting the IMR. The IMR will be separated into two parts: Part A will focus on water quality monitoring conducted per Provision C.8. Part B will provide a synthesis of data and information developed through the implementation of PCB and mercury control pilot studies (MRP provisions C.11 and C.12) and PCB and mercury specific monitoring studies conducted via the RMP. Part B will also incorporate information gained through pollutant loading station monitoring conducted per provision C.8.e. Part B will address:

- Lessons learned,
- Pilot programs and BMP cost-effectiveness,
- Load reductions, and
- Recommendations on steps and criteria to identify opportunities for future implementation.

Table A.3. Bay Area PCB/Mercury Pilot Projects

Project/Watershed Location	City/County	C.11/12.c –Pilot Property ID & Referral	C.11/12.d – Pilot Municipal O&M Enhancement	C.11/12.e – Pilot Stormwater Treatment Retrofit	C.11/12.f -Pilot Stormwater Diversion to POTW	Green Street	Source(s) of Funding
Ettie St. Pump Station watershed	Oakland, Alameda	Yes	Yes - to be Determined Based Upon Desktop Study Results	1. Pump station - amended sand filter	Pump station stormwater to POTW diversion	No	SFBWQIF, ACCWP,
				2. West Oakland industrial area - tree well filters			SFBWQIF, Oakland
Lauritzen Channel watershed	Richmond, Contra Costa	Yes	Yes - to be Determined Based Upon Desktop Study Results	3. 1st and Cutting PG&E substation - bioretention	No	No	SFBWQIF, CCCWP, Richmond
Parr Channel watershed	Richmond, Contra Costa	Yes	Yes - to be Determined Based Upon Desktop Study Results	4. Nevin Ave. Green Street - bioretention, permeable pavement, flow through biotreatment, tree wells.[5]	No	Yes	SFBWQIF, CCCWP, Richmond

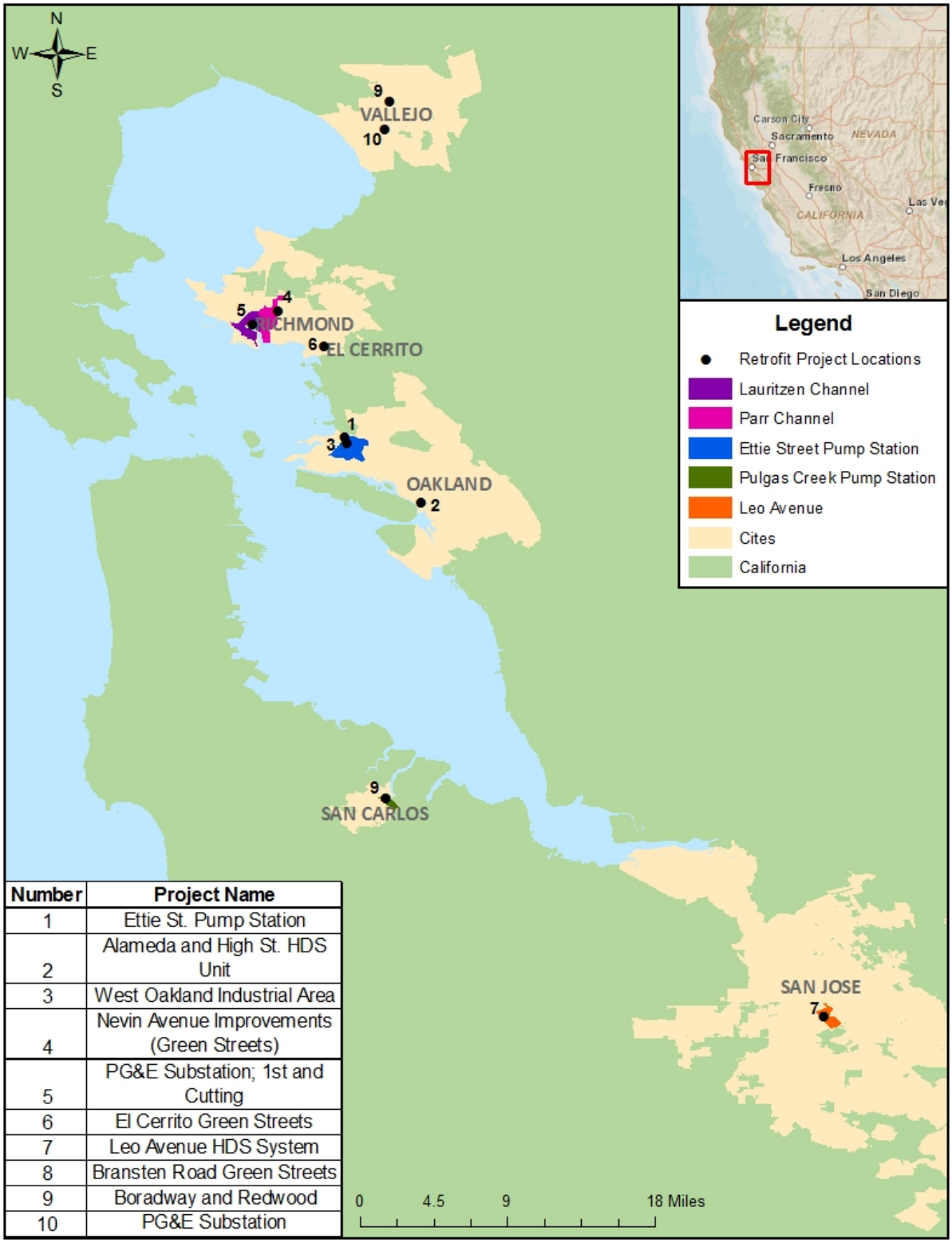
[5]The Nevin Ave. green street improvements are located partly within the Parr Channel watershed and partly within an adjacent watershed in Richmond.

Table A.3. Bay Area PCB/Mercury Pilot Projects

Project/Watershed Location	City/County	C.11/12.c –Pilot Property ID & Referral	C.11/12.d – Pilot Municipal O&M Enhancement	C.11/12.e – Pilot Stormwater Treatment Retrofit	C.11/12.f -Pilot Stormwater Diversion to POTW	Green Street	Source(s) of Funding
Pulgas Creek Pump Station watershed	San Carlos, San Mateo	Yes	Yes - to be Determined Based Upon Desktop Study Results	5. Bransten Rd. Green Street - bioretention and flow through biotreatment curb extensions	Pump station stormwater to POTW diversion	Yes	SFBWQIF, SM County VLF, SMCWPPP, San Carlos
Leo Ave. watershed	San Jose, Santa Clara	Yes	Yes - to be Determined Based Upon Desktop Study Results	6. Hydrodynamic separator for trash and sediment capture	No	No	SFBWQIF, ARRA, SCVURPPP, San Jose
North Richmond Pump Station watershed	Richmond, Contra Costa	No	No	No	Pump station stormwater to POTW diversion	No	SFBWQIF, CCCWP, CCC-FCWCD
Drainage bounded by Hamilton Ave., Bryant St., Channing Ave., and Alma St.	Palo Alto, Santa Clara	No	No	No	Stormwater diversion to POTW	No	SCVURPPP, Palo Alto
State St. Pump Station watershed	Fairfield, Solano	No	No	No	Strategic cleanout of pump station wet well to POTW	No	FSURMP

Table A.3. Bay Area PCB/Mercury Pilot Projects

Project/Watershed Location	City/County	C.11/12.c –Pilot Property ID & Referral	C.11/12.d – Pilot Municipal O&M Enhancement	C.11/12.e – Pilot Stormwater Treatment Retrofit	C.11/12.f -Pilot Stormwater Diversion to POTW	Green Street	Source(s) of Funding
San Pablo Ave. at Madison Ave. and Eureka Ave.	El Cerrito, Contra Costa	No	No	**7.** El Cerrito Green Street - bioretention	No	Yes	SFBWQIF, ARRA, CCCWP, El Cerrito
Alameda and High St. - local unnamed watershed that drains into the canal between Oakland and Alameda	Oakland, Alameda	No	No	**8.** Hydrodynamic separator for trash and sediment capture	No	No	SFBWQIF, ARRA, Oakland
Portion of Broadway (between Redwood and Valle Vista) that drains to the east (from the crown in the road) and the area between the railroad tracks and Broadway	Vallejo, Solano	No	No	**9.** Broadway and Redwood - flow-through biotreatment	No	No	SFBWQIF, FSURMP, VSFCD, Vallejo
Vallejo	Vallejo, Solano	No	No	**10.** Catch basin media filter by PG&E substation	No	No	SFBWQIF, FSURMP, VSFCD, Vallejo



Number	Project Name
1	Ettie St. Pump Station
2	Alameda and High St. HDS Unit
3	West Oakland Industrial Area
4	Nevin Avenue Improvements (Green Streets)
5	PG&E Substation; 1st and Cutting
6	El Cerrito Green Streets
7	Leo Avenue HDS System
8	Bransten Road Green Streets
9	Boradway and Redwood
10	PG&E Substation

Figure A-1. Locations of ten retrofit pilot projects catchment areas and municipal boundaries.

As part of a regional project to outline the IMR, a recent draft memorandum (Appendix A1) summarizes proposed objectives, management questions and associated MRP reporting requirements for Part B of the IMR.

Overview of Clean Watersheds for a Clean Bay

Clean Watersheds for a Clean Bay (CW4CB) is a grant-funded project that is anticipated to result in Permittee compliance with the following MRP Provisions that jointly address PCBs and mercury (each of these provisions is described further in subsequent sections):

- C.11/12.c (CW4CB Tasks 2 and 3) - Pilot Projects to Investigate and Abate Mercury/PCB Sources;
- C.11/12.d (CW4CB Task 4) - Pilot Projects to Evaluate Enhanced Municipal Operations and Maintenance Practices;
- C.11/12.e. (CW4CB Task 5) - Pilot Projects to Evaluate On-Site Stormwater Treatment via Retrofit; and,
- C.11/12.i (CW4CB Task 6) - Development of a Risk Reduction Program Implemented throughout the Region.

These provisions implement priority urban runoff-related actions called for by the San Francisco Bay PCBs and mercury Total Maximum Daily Load (TMDL) water quality restoration programs. CW4CB will help implement these TMDLs by developing and pilot-testing a variety of potential methods to reduce urban runoff loading of PCBs and mercury to the Bay. The project began July 1, 2010 and is scheduled for implementation over four years.[6] CW4CB is facilitated through a partnership among Bay Area municipalities and countywide municipal stormwater management programs and is funded by a grant to BASMAA from the United States Environmental Protection Agency (EPA).[7] A work plan was submitted to USEPA on September 23, 2009 (a final revised version is dated April 19, 2010).[8] The total project cost is $7.04 million - $5M from USEPA and $2.04M matching funds from Bay Area municipal stormwater agencies, municipal wastewater treatment agencies, and industrial dischargers. The project's efforts are also leveraged by in-kind assistance from participating municipalities. The knowledge and experience gained and the lessons learned during CW4CB will be promoted and made readily available to inform future similar efforts by others in the Bay Area and elsewhere in California and the United States.

Oversight and Coordination

A Project Management Team (PMT) consisting of BASMAA's executive director and representatives from several BASMAA member agencies (i.e., Bay Area stormwater

[6]It should be noted that CW4CB started later than originally anticipated. EPA's original Request for Proposal included an anticipated award date of February 2010. However, despite EPA's and BASMAA's best efforts to expedite the process, USEPA was not able to provide BASMAA with an assistance agreement until June 2010 which resulted in a project start date of July 1, 2010.

[7]Funding is through EPA's San Francisco Bay Water Quality Improvement Fund.

[8]Clean Watersheds for a Clean Bay. Proposal/Workplan prepared by BASMAA for USEPA for funding via San Francisco Bay Water Quality Improvement Fund. Submitted September 23, 2009. Revised April 19, 2010.

programs)[9] was formed at the outset of the project. Several Bay Area cities are also participating in CW4CB and send representatives to the PMT.[10] The PMT provides project oversight and facilitates coordination among the participating stormwater programs and cities. The PMT meets periodically, usually on the second Wednesday of the month, and met four times during FY 2011/12: September 14, 2011, November 30, 2011, March 14, 2012 and June 13, 2012. The CW4CB Property Identification and Referral Workgroup (Task 3) also met twice during FY 2011/12: October 12, 2011 and November 9, 2011. In addition, the CW4CB Retrofit Workgroup (Task 5) met four times during FY 2011/12: August 24, 2011, November 30, 2011, January 10, 2012, and April 24, 2012. Meeting highlights and action items are generally memorialized in subsequent meeting agenda packages that are available upon request.

Monitoring Contractor Procurement

During FY 2011/12 the PMT conducted a competitive Request for Proposal (RFP) process (in accordance with USEPA procurement requirements) to select qualified monitoring contractors for all CW4CB field monitoring tasks (i.e., Tasks 3, 4 and 5 - see above descriptions). Two qualified teams were selected.

Technical Advisory Committee

During FY 2010/11, the PMT formed a CW4CB Technical Advisory Committee (TAC). The TAC is tasked with helping to optimize the scientific and technical soundness, integrity, and objectivity of the project. The TAC is comprised of four local and national experts in the field of stormwater pollution control:

1. Dr. Tom Mumley (Assistant Executive Officer, Regional Water Board).
2. Dr. Lester McKee (Director of the Watershed Program, San Francisco Estuary Institute).
3. Scott Taylor, P.E. (Senior Vice President, RBF Consultants)
4. Dr. Roger Bannerman (Environmental Scientist, Wisconsin Department of Natural Resources)

An initial meeting of the TAC was held on October 24, 2011. A meeting summary is available upon request. The next meeting of the TAC will tentatively be held in October 2012.

C.11/12.c - Pilot Projects To Investigate and Abate Mercury/PCB Sources

CW4CB Tasks 2 and 3 are anticipated to result in Permittee compliance with MRP Provisions C.11/12.c. Task 2 of CW4CB was completed during FY 2010/11 and entailed

[9]The following BASMAA agencies are represented on the PMT: San Mateo Countywide Water Pollution Prevention Program, Santa Clara Valley Urban Runoff Pollution Prevention Program, Alameda Countywide Clean Water Program, Contra Costa Clean Water Program, and Fairfield-Suisun Urban Runoff Management Program.

[10]The following cities are participating in CW4CB: City of Oakland, City of San Carlos, City of Richmond, and the City of San Jose.

selecting five Bay Area region watersheds with relatively high levels of PCBs[11] in sediments collected from roadway and stormwater drainage infrastructure and other desirable attributes for pilot source property identification and referral investigations. Task 3 of CW4CB is conducting the investigations. Further details regarding the selection methodology and maps of the watersheds are provided in a progress report that was submitted to USEPA in April 2011.[12] The following five project watersheds were selected:

1. Ettie Street Pump Station watershed in the City of Oakland, Alameda County
2. Lauritzen Channel watershed in the City of Richmond in Contra Costa County
3. Parr Channel watershed in the City of Richmond in Contra Costa County
4. Pulgas Creek Pump Station watershed in the City of San Carlos, San Mateo County
5. Leo Avenue watershed in the City of San Jose, Santa Clara County

During FY 2011/12 Task 3 of CW4CB began implementing the process to identify specific PCB and mercury source properties within the five project watersheds and refer these sites to regulatory agencies for cleanup and abatement. The process consists of the following five steps:

1. Records review. Review general information sources (e.g., spill site databases) and records on specific properties/businesses to begin identifying potential source properties within the pilot watersheds.
2. Driving/walking survey. Perform a driving/walking survey of each pilot watershed to further identify potential source properties and begin looking for evidence that runoff from such locations is likely to convey pollutants to storm drains.
3. Facility inspections. Perform inspections of selected facilities within each pilot watershed.
4. Surface soil/sediment testing. Test surface soils/sediments from the public right-of-way and private properties in the pilot watersheds for PCBs, mercury and other particle-bound pollutants.
5. Property referrals. Where laboratory data confirm elevated pollutant concentrations, refer properties to regulatory agencies for cleanup and abatement.

BASMAA (2011)[13] is a general work plan and guidance for the Steps 1 - 3 above. During FY 2011/12, Steps 1 - 3 were implemented in each project watershed to characterize properties in the watersheds as having higher, medium or lower potential to release PCBs/mercury to streets and stormwater conveyances. It should be noted that in some watersheds some of the Steps 1 - 3 types of activities had been conducted to varying extents in the past and thus the extent of additional effort needed varied. The results from Steps 1 - 3 are being used to inform the development of soil/sediment sampling

[11]Reducing loads of PCBs is the primary selection factor whereas reducing loads of mercury and other sediment-bound pollutants is a secondary consideration.

[12]Clean Watersheds For a Clean Bay (CW4CB) Semi-Annual Progress Report Number 2. April 29, 2011.

[13]BASMAA 2011. General Work Plan and Guidance for CW4CB Task 3 Records Review, Driving/Walking Survey and Facility Inspections. August 2011.

and chemical analysis monitoring programs for each project watershed designed to identify potential source properties. The surface soil/sediment sampling (above Step 4) is anticipated to commence during the fall of 2012, starting with the public right-of-way and then moving to private properties within the project watersheds. Soil/sediment samples will be analyzed for PCBs, mercury, total organic carbon (TOC), and grain size. Approximately 10 percent of these samples (selected randomly) will also be analyzed for dioxins, PBDEs, organochlorine pesticides, and PAHs.

The PMT completed and submitted to USEPA during FY 2011/12 a draft CW4CB Task 3 Sampling and Analysis Plan (SAP) [14] and Quality Assurance Project Plan (QAPP)[15]. USEPA reviewed these documents and provided relatively minor comments, which are currently being addressed.

Further details regarding investigations in individual watersheds are provided in the following sections.

Ettie Street Pump Station Watershed

In FY 2011-12 Oakland City staff worked with Geosyntec Consultants (funded through ACCWP) to review previous inspection and sampling information and identify high priority sites for further site inspections and sampling. In May and June 2012, City and Geosyntec staff inspected or reinspected over 15 industrial sites to evaluate whether those properties are potential sources of PCBs.

Based on data from these inspections, over 30 locations were recommended for sampling via the CW4CB. Some of the recommended locations are industrial properties that are considered "high priority" sites based on historic sources of PCB and/or current inspection information but lack sufficient sampling data to determine if the property is a potential source. Other locations were selected to evaluate the long-term effects of sediment abatement conducted in the street right-of way during 2004. A review of the inspection summaries and additional sampling results will be used to provide referrals to the appropriate regulatory agencies.

Parr Channel and Lauritzen Channel Watershed

CCCWP completed the initial steps (data review, driving inspections, onsite property inspections) of contaminated sediment identification In FY 2010-11. That assessment was based on lessons learned from the 2000 – 2001 investigation of PCBs in MS4 sediment conducted in collaboration with other BASMAA member agencies, and follow-on investigations conducted by CCCWP and the City of Richmond in 2002 and 2005. Based on information from the assessments, one property owner was notified by the City of Richmond that they are not allowed to discharge stormwater from the

[14]Sampling and Analysis Plan: Clean Watersheds for a Clean Bay – Implementing the San Francisco Bay's PCBs and Mercury TMDLs with a Focus on Urban Runoff, USEPA San Francisco Bay Water Quality Improvement Fund Grant No. CFDA 66.202. Prepared by Applied Marine Sciences, Inc. DRAFT July 29, 2011.

[15]Quality Assurance Project Plan: Clean Watersheds for a Clean Bay – Implementing the San Francisco Bay's PCBs and Mercury TMDLs with a Focus on Urban Runoff, USEPA San Francisco Bay Water Quality Improvement Fund Grant No. CFDA 66.202. Prepared by Applied Marine Sciences, Inc. DRAFT July 29, 2011.

property into the MS4 system unless they provide detailed monitoring results for PCBs using appropriately low detection limit, and could demonstrate attainment of EPA benchmark values for other constituents. The property owner stored and re-used stormwater onsite during the 2010 – 2011 storm season.

In FY 2011-12, CCCWP coordinated with other BASMAA member agencies through the CW4CB work groups to share lessons learned by CCCWP about the onsite property inspections. In FY 2011-12 CCCWP also collected a sediment sample from a storm drain near a potential source area in the Lauritzen Channel watershed where a storm drain inlet plugged with sediment had been discovered. The sediment sampled from the storm drain was analyzed for PCBs using EPA Method 8020. PCB results were non-detect (< 250 µg/kg total PCBs), indicating that the sediment did not have PCB concentrations greater than would be expected from an industrial urban setting. Follow on investigations using lower detection limits and targeting suspected source areas in both the Lauritzen and Parr / Harbor watersheds across a wider area are scheduled to occur prior to October 15, 2012 through the CW4CB grant.

Pulgas Creek Pump Station Watershed

In FY 2011-12, the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) continued to implement tasks in the Pulgas Creek Pump Station watershed in compliance with MRP provision C.11.c and C.12.c. The program completed the CW4CB Task 3 records review process for all properties in the Pulgas Creek Pump Station. Address and parcel information on the 481 properties located within the watershed were initially obtained from the San Mateo County assessor website. The records review process identified 140 of these properties as potential source properties. Google Earth™ satellite and aerial imagery software were used to preliminarily identify current land use of properties located within the watershed, including screening out low priority properties such as residential units and commercial buildings. Google Earth™ was also used to collect preliminary information about apparent housekeeping and current property condition, including the existence of unpaved areas and the condition of paved areas such as parking lots and driveways. Program staff then conducted a driving and walking reconnaissance survey in the Pulgas Creek Pump Station watershed to collect additional information about subject properties and verify information collected during the records review. Following the survey, the list of potential source properties was reduced to 40.

Facility inspections were coordinated with the City and the San Mateo County Department of Environmental Health (SMCDEH), the agency that routinely conducts stormwater inspections in the city. Prior to property inspections, SMCDEH sent out letters to each property owner informing them of SMCWPPP's upcoming visit to inspect their sites. Inspections were conducted by Program and SMCDEH staff in April 2012. Thirty-four properties were inspected. During the inspections, Program staff asked the property owner or site manager questions about the property and surrounding area and completed facility inspection forms. Notes were kept about each property and the surrounding area, including locations of existing on-site private storm drain inlets or potential areas of concerns, which were mapped using Google Maps™. There were six properties from the list of 40 that were not inspected due to lack of access (no known

owner, closed business, unsuccessful repeated attempts to contact owner). Those properties were surveyed to the extent possible from outside the property boundaries.

The results of the records review, field survey, and inspections were used to rank each inspected property as high, medium or low priority for right-of-way sampling based on the degree of evidence that PCBs may be on the property and potential for sediment mobilization via stormwater off the site. The inspections identified 8 properties with medium or high potential PCB sources on the property. Of these, five also had medium or high potential for sediment erosion. Another 8 properties had low potential PCB sources on the property, but medium or high potential for sediment erosion. In total, 15 properties were ranked medium or high priority for adjacent right-of-way sampling.

In order to inform selection of potential sediment sampling locations, Program staff ground-truthed locations of storm drain inlets and other features adjacent to medium and high priority properties in May 2012, and identified areas where sediment had accumulated. Sediment sampling locations will likely include storm drain inlets, street curbs, driveways and other areas where sediment appears to be transported off medium and high priority properties and accumulates in the streets/storm drainage system. The Program will finalize the list of right-of-way sampling locations in August/September 2012. A sampling contractor will then use this information to carry out public right-of-way sampling scheduled for September/October 2012 under the direction of Program staff. Results from sampling these right-of-way areas will inform a second round of sediment sampling on private property, to the extent that access can be obtained. Finally, based on the records review, field reconnaissance, and public right-of-way and private property sediment sampling results, the Program will submit a list of facility referrals to the Water Board for follow-up investigations at these properties.

Leo Avenue Watershed

In FY 2011-12, SCVURPPP Co-permittees continued to implement tasks in the Leo Avenue watershed City of San Jose) in compliance with MRP provision C.11.c and C.12.c. In preparation for conducting the source investigation pilot project in the Leo Avenue watershed, the Program and the City of San Jose developed a Work Plan in FY 2010-11 (see Appendix 11-1 of SCVURPPP FY 10-11 Annual Report).

SCVURPPP staff completed a records review of all properties within the Leo Avenue watershed In FY 2011-12. In total, 233 parcels were identified within the watershed and through the records review, 138 were identified as potential PCB sources. Program and City staff then carried out a driving and walking reconnaissance survey around the Leo Avenue watershed to collect additional information about subject properties and check the information collected during the records review. Notes were made to the list of properties derived from the records review to correct and/or add missing information identified during the field reconnaissance. The list of addresses increased from a total of 138 to 159, due to additional identified properties during the survey. The results of the reconnaissance survey and filtering steps using Google Earth™ led to reducing the list of 159 properties to 36. The Program and City staff then assigned an inspection priority to each of the 36 properties. Twenty-nine sites were categorized as high priority and seven as medium priority. This list was then used to determine the locations and priority

for the facility inspections. In addition, four vacant facilities were identified as potential PCB sources due to insufficient information. It was determined that, although the facilities would not be inspected, they would be added to the list of right-of-way sampling sites.

In September and October 2011, City and Program staff conducted property inspections at the 36 sites. All properties were inspected within the planned budget and schedule. Prior to the inspections, the City Stormwater Inspector provided Program staff with an inspection history report, as available, for each facility. During inspections, Program staff member asked the property owner or site manager's questions about the property and surrounding area and completed facility inspection forms. In addition, for each inspection, relevant notes, such as locations of existing on-site private storm drain inlets or potential areas of concern, were drawn on a site map created using Google Maps™.

Information obtained from the inspections was entered into a spreadsheet, including a description of the survey area, evidence about potential historic and/or current PCB sources and notes regarding the potential for sediment mobilization at the site. No obvious sources of PCBs (i.e. no transformers, old hydraulic fluid, etc.) were identified during inspections. However, all sites were ranked as high, medium or low priority for right-of-way sediment sampling based on the degree of evidence that PCBs may be on the property and mobilized via stormwater/sediment transport.

Program staff intends to ground-truth priority right-of-way sampling locations and select the final sampling locations for right-of-way sampling. As part of the operation and maintenance desktop analysis, Program and City staff will ground truth locations of storm drain inlets in front and nearby priority facilities as well as on those street segments that are also considered high priority. Sediment sampling locations will likely include storm drain inlets, street curbs, driveways and other areas where sediment appears to be transported off priority properties and accumulate in the streets/storm drainage system. The Program and City will finalize the list of right-of-way sampling locations in August/September 2012. A sampling contractor will then use this information to carry out public right-of-way sampling scheduled for September/October 2012 under direction from the Program and City. Results from sampling these right-of-way areas will inform the private property sampling. Finally, based on private property sampling results, the Program and City will submit a list of facility referrals to the Water Board for follow-up investigations at these facilities.

C.11/12.d - Pilot Projects to Evaluate Enhanced Municipal Operations and Maintenance Practices

CW4CB Task 4 is anticipated to result in Permittee compliance with MRP Provisions C.11/12.d. This task will evaluate on a pilot-scale methods to enhance the pollutant load reduction benefits of municipal operation and maintenance activities that remove sediment from streets and storm drain system infrastructure. The pilot studies will be conducted within the five project watersheds described in the previous section.

During FY 2010/11, existing literature was reviewed for information on previous studies related to sediment and pollutant removal during municipal operation and maintenance activities and other information relevant to the pilot evaluations[16]. The literature review identified key data gaps with respect to evaluating the effectiveness of municipal sediment management practices in reducing PCB and mercury loads to San Francisco Bay. It also provided recommendations relative to the design of future studies that evaluate the effectiveness of municipal O&M enhancement practices in relation to reducing PCB and mercury loads to the Bay.

BASMAA's FY 2010/11 Regional Pollutants of Concern Annual Report[17] provided a conceptual plan for the municipal O&M enhancement pilot studies. However, based upon the October 24, 2011 TAC meeting and subsequent discussions among BASMAA representatives and Regional Water Board staff, it was agreed that the conceptual plan would benefit from further desktop analysis. BASMAA subsequently developed a workplan[18] for such an analysis, focusing on potentially implementing pilot studies related to enhancement of the following five types of municipal O&M activities:

1. Street sweeping.
2. Storm drain inlet cleaning.
3. Street flushing.
4. Stormwater conveyance pipeline flushing.
5. Pump station maintenance (e.g., vacuuming accumulated materials from pump station wet wells).

The objectives of the desktop analysis are to inform the conceptual planning of municipal O&M enhancement pilot studies during the current permit term and develop tools that will assist future planning of O&M enhancements across a larger geographic scale. It consists of the following five tasks:

1. Create GIS graphical representations of the spatial distribution of mercury and PCB concentrations in the portions of the Bay Area subject to MRP requirements, including the five project watersheds where pilot O&M enhancement studies will occur.
2. Develop a template for a conceptual model of pollutant sources/transport/storage and a preliminary O&M enhancement decision tree, including development of a questionnaire that identifies the information needed to populate the conceptual model and apply the decision tree.
3. For each project watershed, collect the information needed to populate a conceptual model and apply the decision tree.

[16]Sediment Management Practices, Clean Watersheds for a Clean Bay Task 4 Literature Review. Prepared for BASMAA by EOA, Inc. and Geosyntec Consultants. June 7, 2011.

[17]BASMAA 2011. Regional Pollutants of Concern Report for FY2010-2011 and Monitoring Status Report for January-June 2011. September 12, 2011.

[18]BASMAA 2012. Desktop Analysis to Inform Pilot Testing of Municipal Operation and Maintenance Enhancements for PCB and Mercury Load Reduction. Work Plan. March 2012.

4. For each project watershed, populate a conceptual model and apply the decision tree to inform the planning of optimal O&M enhancement pilot studies.
5. Perform pollutant load reduction opportunity analyses, cost estimating, conceptual planning of pilot O&M enhancement pilot studies, and project reporting.

The desktop analysis was initiated during FY 2011/12 and the majority of the work was completed. It is anticipated that the results will be used early in FY 2012/13 to work with the CW4CB TAC to refine the conceptual plan for the pilot O&M enhancement pilot studies.

C.11/12.e. - Conduct Pilot Projects to Evaluate On-Site Stormwater Treatment via Retrofit

CW4CB Task 5 is anticipated to result in Permittee compliance with MRP Provisions C.11/12.e. This task is evaluating ten Bay Area stormwater treatment retrofits to existing infrastructure for effectiveness in reducing pollutant loads. Areas in the Bay Area urban landscape with elevated PCBs are the primary targets for the retrofits, with mercury and other pollutants being a secondary consideration. At least one retrofit is being installed in each of five major Bay Area counties (Santa Clara, San Mateo, Alameda, Contra Costa, and Solano).[19] The retrofits will use proven existing technologies (e.g., filtration devices such as sand filters and green street bioretention facilities) that shown to be effective at removing pollutants when properly designed, installed, operated and maintained. These technologies rely on one or more of a variety of processes to remove pollutants, including sedimentation, filtration, adsorption, and decomposition. Devices that can be characterized as meeting "Low Impact Development" principles are being emphasized to the extent their use is consistent with the overall project objectives.

During FY 2010-11, a preliminary conceptual planning document[20] was prepared that serves as a roadmap for all aspects of the stormwater treatment retrofitting program including planning, design, engineering, permitting and construction of the retrofits and associated schedules and budgets. The strategy for selecting retrofit types and locations included issuing a call for existing/planned Capital Improvement Projects (CIPs) that include or could be modified to include stormwater treatment retrofits. This strategy was chosen based upon the Retrofit Workgroup's assessment that it would likely produce the best results given existing budget and schedule constraints. After completion of the call for projects the workgroup evaluated the results and prepared a document presenting candidate locations and types of urban runoff treatment retrofits.[21]

[19]Some but not all of the retrofits are sited within the five watersheds selected for source property identification and referral described previously.

[20]Conceptual Planning Roadmap for Implementing Urban Runoff Treatment Retrofits, Clean Watersheds for a Clean Bay Task 5. Prepared for BASMAA by Geosyntec Consultants. August 2011.

[21]Candidate Locations and Types of Urban Runoff Treatment Retrofits, Clean Watersheds for a Clean Bay Task 5. Prepared for BASMAA by Geosyntec Consultants. August 2011.

During FY 2011/12, the Retrofit Workgroup refined and finalized a list of ten selected retrofit projects. Some projects "piggy back" on existing projects that were underway or in one case was completed (the El Cerrito Green Streets), while others start from scratch. The projects vary with regard to design and construction status at the time of selection and their ongoing schedule. Appendices A2 and A3 contain tables that summarize a variety of information about the retrofit projects, including treatment types, locations and associated land uses, mercury and PCB concentrations in sediment samples collected from street and storm drain infrastructure in the vicinity of the projects, and project schedules. Appendix A4 is a map showing the retrofit project locations and concentration of PCBs in sediments with 2.5-kilometer "halos" around each data point.[22] Appendix A5 provides project concepts for the retrofits.

During FY 2011/12, the Retrofit Workgroup also conducted a competitive Request for Qualifications (RFQ) process (in accordance with USEPA procurement requirements) to select engineering design services and the projects that needed these services commenced design. In addition, Brian Currier, Ph.D. of the Office of Water Programs, California State University, Sacramento, was retained to develop a conceptual field monitoring plan to evaluate pilot retrofit effectiveness beginning with the 2012/13 rainy season. The results of the monitoring will inform a quantitative estimation of the degree to which the retrofits reduce loads of PCBs (and other pollutants as appropriate) to the Bay. The desired outcome is to evaluate the cost-effectiveness of various stormwater treatment retrofits and provide recommendations regarding potentially implementing the more cost-effective types on a larger scale.

C.11/12.i Development of a Risk Reduction Program Implemented throughout the Region

Provisions C.11/12.i require that Permittees implement a regional program of risk communication activities to raise public awareness of fish contamination issues in San Francisco Bay and to encourage fish-consuming populations to reduce their exposure to pollutants in contaminated fish. These provisions require that Permittees report in this 2012 Annual Report the status of the risk reduction efforts. Task 6 of the CW4CB project work plan (submitted with the FY 2009-10 Annual Reporting Regional Supplement for

POCs and Monitoring) includes a description of the tasks being conducted via the project to raise public awareness and encourage reduction of exposure. The effort includes four general subtasks:

- Sub-task 1. Convene a risk reduction stakeholder advisory group.
- Sub-task 2. Develop a broad risk communication strategy.
- Sub-task 3. Award and oversee implementation of mini-grants.
- Sub-task 4. Conduct evaluation activities.

[22]Based upon sediment concentrations compiled by the San Francisco Estuary Institute as part of a State of California Proposition 13 grant (http://www.sfei.org/urbanstormwaterBMPS).

This section reports on progress during FY 2011-12 for all of the above sub-tasks. Through the CW4CB project in FY 2011-12, the Permittees made significant progress on sub-tasks 1-4 as described in the CW4CB Semi-Annual Progress Reports (excerpted in Appendix A6) and below. The sub-tasks were carried out primarily by the California Department of Public Health (CDPH) under contract through the Aquatic Science Center (ASC) to BASMAA as part of what is called the "San Francisco Bay Fish Project" (SFBFP). BASMAA oversaw implementation through its participation in the SFBFP's Stakeholder Advisory Group (SAG) that also includes representatives from the Bay Area Clean Water Agencies (BACWA), Regional Water Quality Control Board, EPA, and county health departments.

The time periods covered by the CW4CB Semi-Annual Progress Reports are based on those of the funding agency – EPA, which is on the federal fiscal year (October – September). So the CW4CB Semi-Annual Progress Report that would cover the April through June 2012 time period will not be completed until after September 2012. Accordingly, progress during April through June 2012 on the four sub-tasks is reported in the Quarterly Report from CDPH (see Appendix A7). The extensive number of attachments referenced are available upon request.

C.11/12.f Pilot Stormwater Diversion Projects

Regional Overview

This status report summarizes activities by Permittees to implement actions required under provisions C.11.f and C.12.f of the MRP. These are nearly identical provisions for control of mercury and polychlorinated biphenyls (PCBs) that require the evaluation of pilot diversions of dry weather and/or first flush events to publically owned treatment works (POTWs). The pilot projects are being evaluated in parallel with other BMP pilot implementation projects. The results of pilot studies will inform decisions regarding future permit requirements for these (and possibly other) pollutants.

Results of a feasibility evaluation, coordinated through a BASMAA regional project, were included in the Regional Pollutants of Concern and Monitoring Supplement to the 2010 Annual Report. The evaluation included selection criteria for potential diversion projects, and identified candidate projects in each of the five counties regulated under the MRP. Based on input from the Water Board, a revised Feasibility Evaluation Report was submitted in December 2010. A status report on the diversion projects was submitted with the Regional Pollutants of Concern and Monitoring Supplement to the 2011 Annual Report to meet the MRP's annual reporting requirement for 2011. This report serves to meet the MRP's annual reporting requirement for 2012.

Planning activities for the diversion projects were ongoing during FY 2011-12. Agencies conducting the diversion projects each prepared internal workplan that identified project objectives, equipment and infrastructure requirements, water quality monitoring (including analytical methods), a general framework for identifying costs, benefits and operation challenges associated with the diversions, and a time schedule for monitoring, evaluation and reporting. The internal workplan were provided to the Water

Board in May 2012 along with a summary matrix explaining the evaluation approach, included as Appendix A8.

Through a regional project to outline the POCs portion of the March 2014 IMR, BASMAA will provide the agencies implementing diversion pilots with a more detailed analytical framework for elements that will be presented in the IMR's overall evaluation of diversion strategies, including:

- methods of data analysis,
- loading calculations,
- cost documentation and extrapolation of capital and O&M costs,
- refinement of future site selection criteria,
- development of analytical tools,
- consideration of POTW requirements

The following pages provide a brief overview and current status for each of the pilot diversion projects. Monitoring at four of the project sites (in Alameda, Santa Clara, San Mateo, and Solano Counties) will commence during the third quarter of 2012. Monitoring for the Contra Costa County project will commence in 1st quarter 2014, to complement information from previous characterization monitoring. Agencies will continue to communicate with Water Board staff as the projects progress, and may adapt their workplan in response to those discussions.

Alameda County

Project Overview and Objectives

ACCWP identified the Ettie Street Pump Station (ESPS) as its candidate for the pilot study located in Alameda County, based on elevated PCB and mercury concentrations found in previous studies of sediment in the ESPS and its watershed and also on the station's geographical proximity to the East Bay Municipal Utilities District (EBMUD) conveyance and wastewater treatment systems (see Figure A-2)

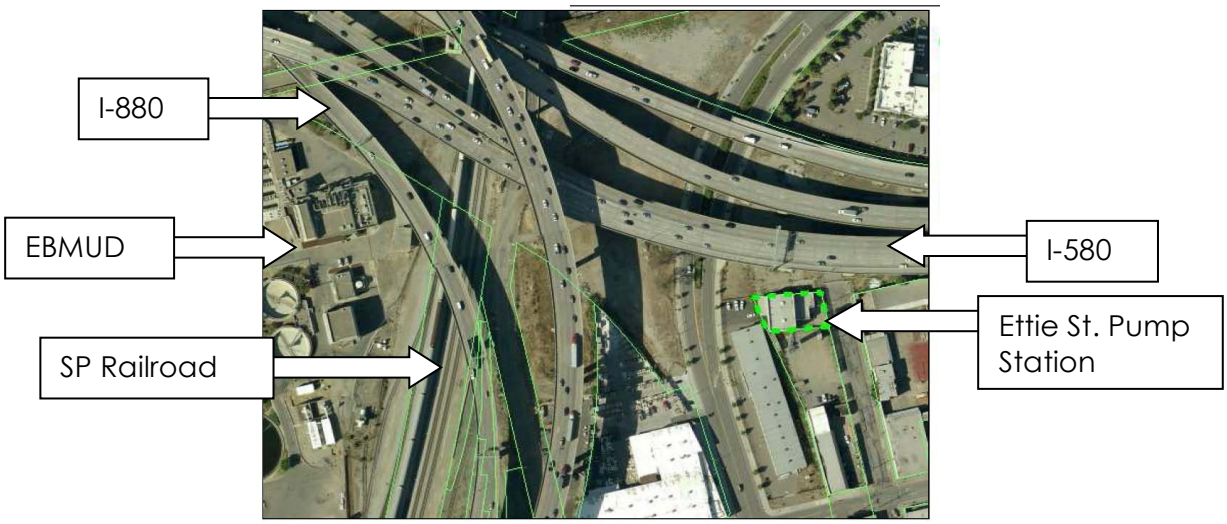


Figure A-2. Ettie Street Pump Station and vicinity, showing nearby transportation facilities and EBMUD treatment plant

EBMUD previously investigated the feasibility of a stormwater diversion at Ettie Street for consideration as a possible PCB and mercury reduction offset program, collecting composite water samples between April 2008 and February 2010 from the pump station forebay during dry weather, first flush, and wet weather events. A pilot dry weather diversion of 75 gallons per minute (gpm) was also implemented during the same time period using a connection to an existing sanitary line in the ESPS. The EBMUD study report noted that while the additional treatment volumes from the diversion would not significantly affect EBMUD discharge quality or operations, more "specific" data were needed to address the storm-to-storm variability, and that EBMUD would need to evaluate hydraulic capacity, costs and regulatory implications to clarify the acceptability of a long-term diversion project. Average PCB concentrations during first flush or ordinary wet weather averaged an order of magnitude higher than in dry weather, and were more variable. Thus the opportunities for reducing PCB loads are much higher for diversions implemented during wet weather. Infiltration in the aging sanitary conveyance system causes capacity problems at the EBMUD plant during peak runoff flows. ACCWP's study therefore focuses on diversion scenarios involving pretreatment storage of stormwater runoff prior to dry weather discharge to the sanitary sewer.

Studies of runoff loading by the Regional Monitoring Program for Water Quality in the San Francisco Estuary (RMP) have inaugurated the use of continuous turbidity monitoring as a more sensitive way to identify the onset of storm discharge, as well as a surrogate for characterizing the within-storm variations in transport of sediments and pollutants associated with fine sediments, such as PCBs and mercury. The Small Tributaries Loading Strategy, described in the context of MRP Provision C.8.e in Part B of this report, uses the turbidity surrogate approach as a basis for regional monitoring and modeling to address management questions about the occurrence and overall magnitude of mercury and PCB loads from local watersheds to San Francisco Bay. In the context of planning for STLS monitoring, the RMP conducted reconnaissance

stormwater grab sampling during FY2010-11 in 16 watersheds; samples from the ESPS forebay collected for this study confirmed elevated pollutant concentrations and provided initial ranging values of turbidity and suspended sediment.

To support the overall goals of improving understanding of the cost-effective applications for mercury and PCB controls, this project has the following objectives:

1. Evaluate potential for PCB and mercury load reductions under scenarios of different diversion pumping regimes
2. Test use of turbidity thresholds as trigger criteria for diversion
3. Establish a site-specific relationship between particle size, concentrations of PCB and mercury and turbidity to support annual load estimates
4. Develop scenarios for larger-scale pretreatment and diversion and document additional feasibility considerations involved
5. Evaluate costs and benefits of the pilot project and larger-scale implementation scenarios
6. Coordinate system and monitoring design with pilot retrofit media filters to maximize data leverage and cost-effectiveness for both pilots.

Current Status

Installation of the turbidity probe and preliminary sampling during one storm event were conducted at the ESPS in spring 2012. Installation of a 500 gallon stainless steel storage tank for the small-scale pilot diversion will be completed in summer 2012, followed by dry season sampling and diversion. During the FY2012-13 rainy season, monitoring will be coordinated with monitoring for the treatment retrofit to be installed as described in the reporting above for Provisions C.11/12.e. The retrofit will use the same pump and pretreatment storage tank as the diversion project to supply water to the planned media filter beds.

Based on comments by Water Board staff on the previous workplan version provided in May 2012, the monitoring design will be revised to leverage the CW4CB monitoring efforts and increase the ACCWP resources directed to evaluation of costs and benefits associated with a larger scale diversion concept to be developed during FY12-13. The larger-scale diversion scenario is to incorporate the following elements:

- Larger pretreatment storage facilities constructed on adjacent land underneath the MacArthur Freeway (see Figure A-2) through either easement rights granted by the State of California to ACFCWCD or a Common Use Agreement between the State and ACFCWCD.
- Permanent diversion conveyance from ESPS to the pretreatment facility
- Permanent diversion conveyance from pretreatment to sanitary sewer. Challenges in obtaining easements for new conveyance across existing freeways and railroads will be evaluated in comparison to potential conveyance via connections to existing sanitary sewer lines owned by the City of Oakland.
- Diversion from ESPS to pretreatment that would be triggered by turbidity thresholds during wet weather and timed intervals or ESPS water levels during dry

weather. Multiple scenarios of diversion timing and volume will be developed in consideration of the characteristics and constraints of facility capacity and conveyance design.
- Estimated construction and operating costs for facilities and equipment for pumping, controls and monitoring, maintenance, sediment disposal and security for all facilities.
- Outlining terms of agreement with EBMUD for ongoing sharing of costs and TMDL load allocations for PCBs and mercury associated with the amounts transferred through stormwater diversion,

Contra Costa County

Project Overview and Objectives

The Contra Costa Clean Water Program (CCCWP) is facilitating design of a pilot project (Project) to divert urban runoff from the North Richmond Stormwater Pump Station (NRSPS) into the West County Wastewater District (WCWD). NRSPS is jointly owned by Contra Costa County (61 percent) and City of Richmond (39 percent) based on the 1974 agreement. WCWD is currently under a separate contract to maintain and operate the NRSPS.

The Project is being implemented to comply with the requirements of Provisions C.11.f and C.12.f of the Municipal Regional Permit for Urban Stormwater (MRP). The Project is being implemented by Contra Costa County Flood Control and Water Conservation District (CCC-FCWCD), a co-permittee of the Contra Costa Clean Water Program (CCCWP). CCC-FCWCD sought and obtained grant funding administered by the San Francisco Estuary Project through U.S. EPA's San Francisco Bay Area Water Quality Improvement Fund. The project is one of several in the "Estuary 2100 Phase 2: Building Partnerships for Resilient Watersheds" program. The grant provides $496,649 in USEPA funds, matched by $165,550 from CCC-FCWCD to plan, design, construct, and monitor an engineered diversion into WCWD.

In addition of the match provided by CCC-FCWCD, CCCWP is providing in-kind consultant resources from its program management consultant Brown and Caldwell. Brown and Caldwell assists with coordination and development of plans, designs, and cost estimates for the pilot diversion project.

The North Richmond Storm Drain Project, of which the NRSPS is a part, is designed to control the stormwater flooding conditions for the unincorporated area of North Richmond. The project consists of a network of stormwater collection sewers which drain into the wet well of the pump station. The stormwater is then pumped into the discharge channel of the pump station which drains by gravity into a 78-inch discharge pipeline.

As shown on Figure A-3 the project site is located in a watershed comprised mainly of industrial and residential land uses in the unincorporated area adjacent to the north boundary of the City of Richmond. The North Richmond Storm Drain System (NRSDS)

delivers stormwater to the NRSPS located on the southwest corner of Gertrude Avenue and Richmond Parkway. The station's 78-inch discharge pipeline runs westward from the pump station along an easement on the Chevron Chemical Company's property just south of Gertrude Avenue. At about 950 feet downstream of the pump station, the pipeline expands into an 8-foot by 4-foot box culvert which crosses Gertrude Avenue and runs into a trapezoidal earth channel that drains to Wildcat Creek.

The NRSPS consists of a 3-level main structure and a discharge channel. The discharge pipes from the storm water pumps rise vertically from the wet well and enter the discharge channel by going through the west wall of the main structure. In order to prevent the stormwater in the discharge channel from flowing back into the wet well, an overflow weir is built around the end of each of the discharge pipes from the larger pumps, and flap gates are installed at the ends of the discharge pipes from the smaller pumps.

Table A.4 summarizes current pump station information as of April 2012 provided by WCWD Maintenance staff.

Figure A-3. Site Map of North Richmond Stormwater Pump Station Diversion Project

Table A.4. Information Summary for North Richmond Stormwater Pump Station

NRSPS Components	Original Design	Current Condition [1]	Notes
Wet weather pumps:	4 vertical, propeller type, natural gas engine driven pump rated at 45,000 gpm with a TDH of 19.2 feet.	3 pumps are in service, 1 pump is out of order	
Dry weather pumps:	2 vertical, propeller type, electric motor driven pump rated at 3,500 gpm with a TDH of 11 feet.	Both pumps are out of order	Rehabilitation or replacement of the dry weather pumps should be done as soon as possible.
Wet Well Dewatering pumps	2 submersible nonclog type, electric motor driven pump rated at 40 gpm with a TDH of 21 feet.	Both pumps are out of order and removed.	New submersible pumps should be installed with fittings that would allow flow diversion to WCWD.
Wet weather discharge	48-inch	48-inch	
Dry weather discharge	14-inch	14-inch	
Pump operation	Controlled by water level in the wet well. Wet Weather pumps operate only when inflow is high, such as during a rainfall event.	Wet Weather pumps operate approximately 5-10 minutes every day to lower the wet well water level.	This mode of operation is very inefficient and may lead to possible damage to the pump drives.
Wet weather Flow	10-year storm, 135,000 gpm	-	Flow rate check based on CCC-FCD Rational Method: 10-year 60-min storm, 130,000 gpm
Dry weather Flow	1.0 cfs (0.65 mgd)	0.55 cfs (0.36 mgd)	Based on the daily pumping records from 2009.

Objectives identified for the NRSPS diversion project include:

1. Evaluate PCB and mercury loads avoided through pump station maintenance conducted in conjunction with diversion to a POTW.
2. Design a diversion pilot project that can be permitted for discharge to West County Wastewater District
3. Evaluate operating techniques that can treat first flush without adversely impacting POTW capacity

Current Status

Brown and Caldwell has been directed by CCCWP to develop a preliminary design report. Key activities of the approved work plan and estimated schedule are summarized below.

February - March 2012 Tasks Completed

1. Met with CCC-FCWCD, CCCWP, City of Richmond, and during the week of February 28, 2012.
2. Gathered Information related to:
    - Existing monitoring data from San Francisco Estuary Institute (SFEI)
    - As-Built drawing for the existing North Richmond Stormwater Pump Station (NRSPS).
    - GIS layers: sewer system, street, parcel, aerial photo, ground surface elevation, etc.
    - Meeting notes, plans, and communications
    - Treatment efficiency data for West County Wastewater Treatment Plant(WCWTP)

March – April 2012 Tasks Completed

1. Reviewed collected data
2. Met with SFEI to go over monitoring data and lessons learned (Initial meeting; completed, final Data in review)
3. Prepared water quality review Tech Memo to answer:
    - What's in the dry weather and wet weather flow?
    - What are expected pollutant load reductions from dry weather and wet weather diversions?
    - What would be potential impact on the WCWTP effluent from dry weather and wet weather diversions?
    - Does the dry weather and wet weather flow water quality meet WCWTP local limits?
    - Are there any obvious fatal flaws to a dry weather or wet weather diversion, based on water quality?

May – October Agency Coordination Tasks Planned and Completed

1. Briefed SFRWQCB Assistant Executive Officer, Tom Mumley, on approach and status (Completed)
2. Site visit to North Richmond Pump Station (Completed)
3. Initial scoping meeting with WCWD (Completed)
4. Follow-on meetings with WCWD and SFRWQCB Staff (Completed)
5. Present diversion concept to WCWD Board (Planned for September 2012)
6. Pre-treatment Permit Application (Planned for October 2012)

San Mateo County

Project Overview and Objectives

The San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) pilot diversion project will evaluate the diversion of dry weather and first flush flows of stormwater from near the Pulgas Creek Pump Station to the sanitary sewer collection system served by the South Bayside System Authority's (SBSA) regional wastewater treatment plant. As described in last fiscal year's annual report, SMCWPPP selected the City of San Carlos' Pulgas Creek Pump Station watershed for the pilot diversion project and other CW4CB studies because of the relatively high concentrations of PCBs found in pump station and storm drain sediments. The approximately 330-acre watershed draining to the Pulgas Creek Pump Station is comprised of current and historic industrial land uses.

In FY 2012/13 the pilot diversion project will conduct wet and dry weather pilot scale diversions of urban runoff from the north Pulgas Creek storm drain line. A flow meter and turbidity sensor will be installed in the north Pulgas Creek storm drain line manhole, located immediately upstream from the pump station. Water will be collected for diversion through a small submersible pump that will send water through a flexible conduit to a 500 gallon storage tank located in the yard adjacent to the pump station. Water from the storage tank will be collected and transported by the City of San Carlos' vactor truck for disposal through a sanitary sewer connection at the City of San Carlos' corporation yard.

Targeted wet weather diversions will include, to the extent feasible, the first rainfall event of the 2012-2013 wet season, plus up to three additional events. During each of the targeted storm events, discrete water quality samples will be collected from the north Pulgas Creek storm drain line and tested for PCBs, mercury, and suspended sediment concentrations. In addition, as required by SBSA, testing will also be conducted during disposal of diverted stormwater collected during two events. These samples will be collected from the vactor truck discharge to the corporation yard's sanitary sewer connection. Testing of these samples will be for copper, mercury, and PCBs as the total of 40 congeners. Sampling will also be conducted in connection with several dry weather diversion events between July and October 2012.

The pilot diversion project will also evaluate the projected costs and benefits of a larger scale and more permanent dry and/or wet weather diversion at the Pulgas Creek Pump station in order to have the technical information needed to evaluate the feasibility of diversions as part of future stormwater NPDES permit terms. The evaluation will also include how to coordinate possible plans for a long-term, more permanent sewer diversion with the City of San Carlos' planned upsizing of sewer pipelines along Industrial Road and Brittan Road in the vicinity of the Pulgas Creek Pump Station. One of the major problems with trying to divert stormwater to the sanitary sewer system in the Pulgas Creek Pump Station drainage area is that the sewer system is undersized in the Pulgas Creek Pump Station area, and the City of San Carlos is already at its maximum capacity for discharging wastewater to SBSA.

Current Status

This section describes the progress and current status of the Pulgas Creek Pump Station pilot diversion project in the following areas: confirmation of relatively elevated PCB levels in stormwater flowing to the pump station; preparation of an internal project work plan provided to the Water Board in May 2012; procurement of a wastewater discharge permit from SBSA; and identification and mobilization of equipment needed for the pilot diversion project.

Confirmation of Relatively Elevated PCB Levels in Stormwater

As part of a stormwater runoff characterization study conducted for the Small Tributaries Loading Strategy of the Regional Monitoring Program, analyses of PCBs and mercury were performed on stormwater samples from the two storm drain lines that flow to the Pulgas Creek Pump Station. The PCB results in Table A.5 show that the stormwater contained between about 19,000 and 84,500 picograms per liter (pg/l) of total PCBs, which is relatively elevated compared to the 886 pg/l Event Mean Concentration of total PCBs calculated by SFEI from stormwater runoff sampling with similar methods from a parking lot and recreation area in Daly City.

Table A.5. Total PCBs (pg/l – total of 40 congeners) in Stormwater Runoff to Pulgas Creek Pump Station in San Mateo County

Sampling Date*	North Pulgas Creek Storm Drain Line	South Pulgas Creek Storm Drain Line
Feb. 17, 2011	46,896	53,894
	43,339	19,060
March 18, 2011	84,490	31,043
	66,554	21,883
Average	60,320	31,470

*Samples collected on the same dates were collected at different times.

The data also show that the concentrations of total PCBs from the north Pulgas Creek storm drain line appear to be higher than those found in the south Pulgas Creek storm drain line.

Pilot Diversion Project Internal Work Plan Provided to Water Board in May 2012

As requested by the Water Board staff, the Countywide Program prepared and on May 4, 2012 submitted to the Water Board an internal project work plan titled "Pulgas Creek Pump Station Pilot Urban Runoff Diversion Evaluation." This internal work plan describes the current approach for how the pilot diversion project will be implemented. The work plan describes the project background, objectives, tasks, implementation, and schedule. This internal work plan may be modified iteratively in order to take advantage of new information as it is developed.

SBSA's Wastewater Discharge Permit

One of the essential requirements of the pilot diversion project is to be able to dispose diverted dry weather urban runoff and stormwater to the City of San Carlos' sanitary sewer system. From the city's collection system flows continue to SBSA's collection system for treatment at SBSA's regional wastewater treatment plant. The Countywide Program staff worked with SBSA and City of San Carlos' staff to obtain a wastewater discharge permit for the City of San Carlos.

In June 2012 SBSA staff distributed a draft permit, and based on discussions among City of San Carlos, SBSA, and Countywide Program staff, modifications to the draft were proposed and accepted. The final permit was executed during the first half of July 2012 when it was signed by SBSA's Plant Manager and the City of San Carlos' acting City Engineer. The permit authorizes the diversion of limited volume of dry weather urban runoff and stormwater for a one-year period between July 1, 2012 and June 30, 2013. The permit describes discharge, monitoring, and reporting requirements, and it incorporates as an attachment A the internal project work plan provided to the Water Board in May 2012. The discharge permit is subject to revision at any time for the purposes of protecting the sanitary sewerage facilities and workers and to accommodate new regulations and NPDES permit requirements that may be imposed on SBSA.

Equipment Identification and Mobilization

The equipment that will be needed to implement the pilot diversion project has been identified and is in the process of being procured and installed so that the project may be initiated with the first dry weather sample.

Santa Clara County

Project Overview and Objectives

The pilot diversion project that is currently being implemented by the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP), in cooperation with the City of Palo Alto, is an evaluation of an existing dry and wet weather diversion structure located in the City of Palo Alto (Figure A-4). The diversion structure was constructed in 1993 to divert a limited volume of urban runoff from the stormwater conveyance system to the Palo Alto Regional Water Quality Control Plant. The area draining to the diversion structure is roughly 50 acres and is bound by Hamilton Avenue, Bryant Street, Channing Avenue and Alma Street. The site was originally selected by the City of Palo Alto because of the land use in the drainage area (commercial, light industrial, multi-family residential), proximity of the 27" sewer trunk line to the storm drain line, and because the sewer trunk line had excess capacity. The structure was designed to divert urban runoff flows into the sanitary sewer at a rate of no more than 0.5 million gallons per day (MGD).

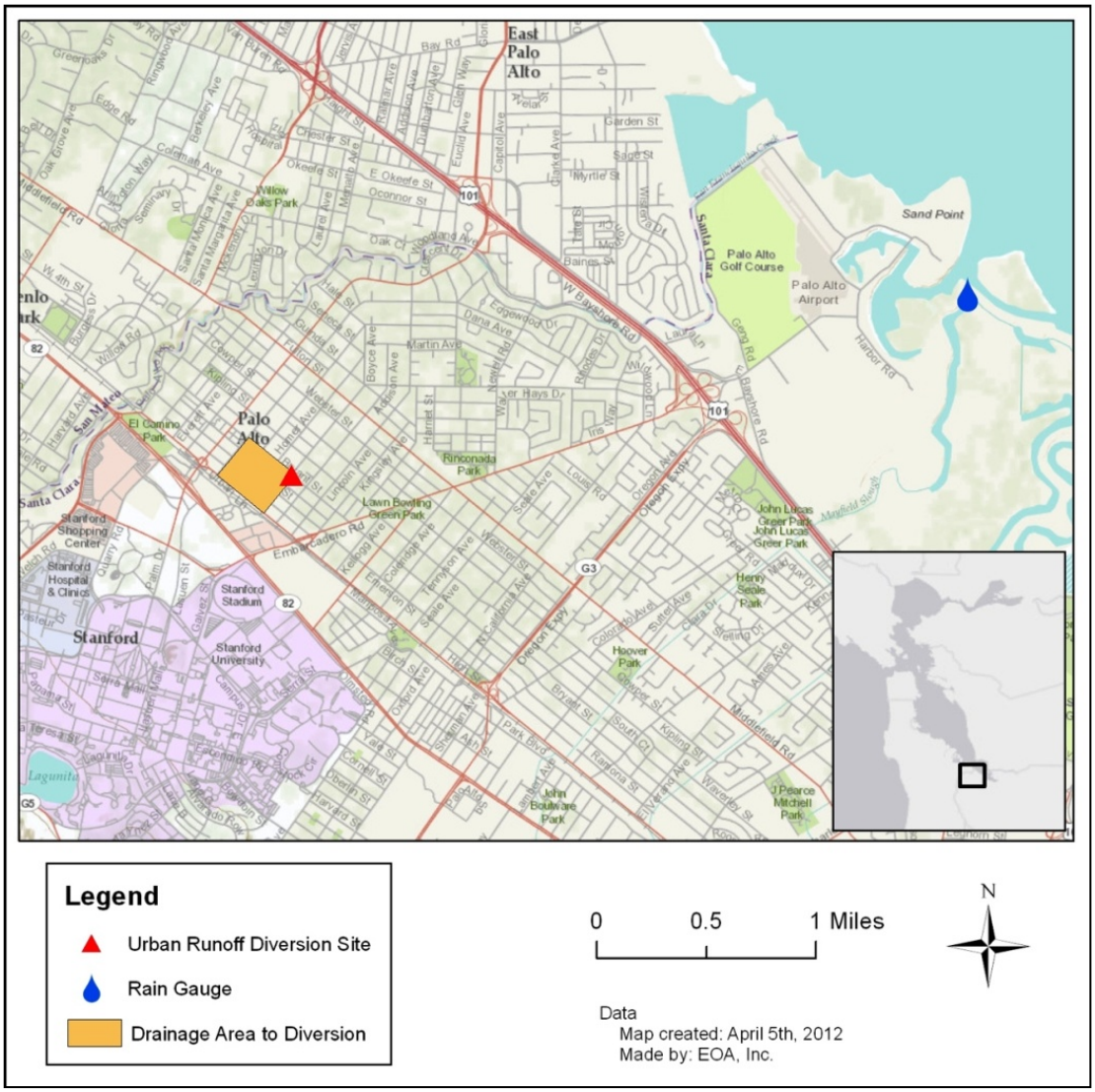


Figure A-4. Location of the City of Palo Alto Urban Runoff Diversion Structure, Santa Clara County, CA.

The overall goal of this pilot project is to comply with provision C.11/12.f of the MRP by better understanding the applicability, costs and benefits associated with the existing Palo Alto urban runoff diversion structure. The results from this and other parallel studies will inform planning for focused implementation of urban runoff control measures during subsequent Permit terms in order to achieve maximum benefit and continue to make progress towards achieving load reductions called for in mercury and PCB reduction strategies (i.e., Total Maximum Daily Loads).

The Palo Alto pilot diversion project was designed to address the following three objectives:

1. Evaluate pollutant loads to the Bay that are reduced due to current operation of the existing diversion structure.
2. Estimate projected benefits, challenges and costs of constructing and operating a similar diversion structure in other watersheds (e.g., a larger drainage area and/or an area known to have elevated concentrations of PCBs or mercury).
3. Document the knowledge and experience gained from evaluation of the diversion structure to inform planning of urban runoff diversions in the next permit term.

Current Status

An internal work plan was developed which describes the methods that will be used to evaluate the effectiveness of the Palo Alto diversion structure and fulfill the objectives of the project. This internal work plan was provided to the Water Board in May 2012. The work plan is intended to guide monitoring and data collection activities over Fiscal Year 2012-13. Work plan tasks include: (1) project planning; (2) water quality monitoring; (3) evaluation of diversion costs and operational challenges; (4) cost and benefit analysis; and (5) reporting. Project planning activities have been ongoing during 2011-12.

Preparations for monitoring have begun, and monitoring is expected to start in August or early September 2012. Monitoring activities will continue through the winter of 2012-13. The volume and turbidity of urban runoff flowing into and through the diversion structure will be monitored continuously during this timeframe. Water quality parameters, including suspended sediment concentrations, particle size distribution, and Hg and PCB concentrations will be monitored during a minimum of two dry weather and four wet weather events. These data will be used to calculate loads removed from urban runoff due to the diversion structure.

In addition, the internal work plan defined a framework to evaluate the construction, operation and costs associated with the diversion structure. This framework is being used to guide information gathering activities associated with work plan Task 3 (evaluation of diversion costs and operational challenges). Activities that have been initiated during the year under this task include gathering and reviewing construction documents, and mapping and documentation of the site and the diversion structure. Additional information gathering, including investigation into construction and maintenance costs and operational challenges and constraints to the POTW receiving the diversion will continue during 2012-13.

Solano County

Project Overview and Objectives

The Solano County pilot diversion project is being implemented by the Fairfield Suisun Urban Runoff Program (FSURMP) and Fairfield-Suisun Sewer District (FSSD). The project involves changes to the operation of an existing pump station so as to divert stormwater from the station to the FSSD wastewater treatment plant. The State Street pump station is located in the City of Fairfield just upstream of Suisun City. It serves a watershed area of approximately 6 acres. The contributing area is commercial, of which a significant portion is automotive repair. (See Figures A-5 and A-6).

The pump station changes to be evaluated for this project include:

- Shutting off the stormwater pump station during dry weather
- Removing standing water in the pump station wet well throughout the dry season and before the first flush
- Monitoring concentrations of pollutants and pollutant indicators in the diverted water

The goal of this pilot project is to comply with provision C.11/12.f of the MRP by better understanding the applicability, costs, and benefits associated with this and similar projects. The results from this and parallel studies by other agencies will inform planning for focused implementation of urban runoff control measures during subsequent Permit terms, in order to achieve maximum benefit and continue to make progress towards achieving load reductions called for in the mercury and PCB TMDLs.

The following three objectives have been developed for the project:

1. Evaluate pollutant loads to the Bay that are reduced due to stormwater diversion.
2. Estimate projected benefits, challenges and costs of operating a similar diversion in a similar drainage area and/or an area known to have elevated concentrations of PCBs or mercury.
3. Document the knowledge and experience gained from evaluation of the diversion project.

Current Status

Normal discharges from the State Street Pump Station were terminated in mid-June. The contents of the pump station's wet well (approximately 825 gallons) were subsequently removed by FSSD staff using a Vactor truck. Prior to removal, the discharge pumps were operated to mix the contents and to collect a representative sample. The sample was analyzed for PCBs (EPA 1668 and USEPA 608), mercury (EPA 1631), total organic carbon (SM 5310B), total metals (EPA 245.1), and suspended sediment concentration (ASTM 3977C). The contents were trucked and discharged to

the FSSD treatment plant. As an "in-house" pilot project, there were no formal agreements established for treatment plant's acceptance of the discharge.

As dry weather runoff accumulates in the pump station, FSURMP and FSSD will repeat the removal and sampling process several times more during the summer of 2012. In the fall, the pump station will resume normal operation.

Figure A-5. Solano County Diversion Project Location

Figure A-6. State Street Pump Station Location and Contributing Area

C.11/12.g Monitor Stormwater Pollutant Loads and Loads Reduced

Provisions C.11.g and C.12.g require Permittees to develop and implement a monitoring program to quantify mercury and PCB loads and loads reduced through source control, treatment and other management measures implemented by Permittees. Average annual region-wide mercury (160 kg/yr) and PCB (20 kg/yr) loads to the San Francisco Bay from urban (and non-urban) runoff discharges have been calculated by the Water Board through the development of Total Maximum Daily Loads (TMDLs) for these pollutants. Over the next five years, refinement of PCB and mercury loading estimates will occur through the implementation of Pollutants of Concern Monitoring required by Provision C.8.e, and associated technical studies coordinated through the BASMAA Regional Monitoring Coalition (see Part B, Monitoring Status Report) and the Regional Monitoring Program for Water Quality in the San Francisco Estuary (RMP). These loading estimates provide a baseline to which compliance with TMDL Waste Load Allocations (WLAs) issued to Bay Area stormwater agencies can be determined.

Additionally, a BASMAA regional project was initiated in FY 2009-10 to develop methods to assess Permittee progress towards TMDL milestones and attainment of WLAs. The project is ongoing and entails the review of existing information on loads reduced methodologies developed through other recent efforts (such as the Proposition 13

Urban Runoff BMP Project[23]) and development of draft loads reduced formulas for specific stormwater management measures. These methods will assist Permittees in calculating PCB and mercury loads reduced through stormwater management measures. A draft technical memorandum describing initial load reduction quantification methods was submitted to the Water Board in the BASMAA FY 2009-10 Regional POCs and Monitoring Supplement. Written comments were received by Water Board staff and are being addressed through on-going development of revised methods.

In FY 2011-12, Permittees continued to develop load reduction quantification methods for PCBs and mercury. Efforts were made to align methods for PCBs/Hg with those currently under development for trash (see Trash Section). As information on the effectiveness of management measures becomes available via the Clean Watersheds for Clean Bay (CW4CB) project or other MRP-required pilot studies, methods will also be revised. Discussions regarding revisions to these methods are planned in FY 2012-13 via the BASMAA Monitoring and Pollutant of Concern Committee (MPC). Revised methods are planned for submittal with the FY 2012-13 Annual Report. Loads reduced reporting for PCBs and mercury will begin with the Integrated Monitoring Report due on March 15, 2014 in compliance with the MRP.

MERCURY CONTROLS

C.11.b. Monitor Methylmercury

MRP Provision C.11.b duplicates the requirement in C.8.g to report results of methylmercury monitoring required in Provision C.8.e. Per the schedule for commencement of POC monitoring described in the Monitoring Status Report, methylmercury monitoring began in FY 2011-12 and the results will be reported in B urban creeks monitoring report to be submitted in March 2013.

C.11.h Fate and Transport Study of Mercury in Urban Runoff

This MRP provision requires Permittees to conduct or cause to be conducted studies aimed at better understanding the fate, transport, and biological uptake of mercury discharged in urban runoff to San Francisco Bay and tidal areas. The 2009-10 annual report described the specific manner in which Permittees will meet these information needs through the RMP. The RMP Multi-year Plan (see Appendix A9) describes several strategies to address pollutant-specific information needs and support management decisions through investigation of prioritized Management Questions.

During FY 2011-12, the RMP submitted a journal manuscript for a synthesis of results from recently completed studies on food web uptake and methods to identify high leverage pathways that introduce mercury to Bay food webs. A more extended Mercury Synthesis report for the RMP will be produced to include additional data from a study of

[23] Conducted by SFEI; project deliverables and data are at http://www.sfei.org/urbanstormwaterBMPS

mercury food web uptake in small fish, and more detailed recommendations on filling information needs for San Francisco Bay, which include:

- Data for additional popular sport fish species;
- Improved spatial understanding of exposure to mercury uptake, particularly in tidal marshes, managed ponds, reservoirs, and streams;
- Information to promote understanding of the potential benefits of management actions at local and regional scales;
- Evaluation of the effectiveness of management actions at local and regional scales; and
- The overall potential for reduction of net methylmercury production at a regional scale is

BASMAA representatives will continue participation in RMP Work Groups and Committees to ensure future implementation of studies that meet the MRP's stated information needs, which include understanding the in-Bay transport of mercury discharged in urban runoff, the influence of urban runoff on the patterns of food web mercury accumulation, and the identification of drainages where urban runoff mercury is particularly important in food web accumulation.

C.11.j Mercury Wasteload Allocation Sharing with Caltrans

The San Francisco Bay Mercury TMDL wasteload allocations for urban stormwater implicitly include California Department of Transportation (Caltrans) facilities located within the geographic boundaries of Bay Area urban runoff management agencies. Caltrans manages roadways and other transportation facilities within the urban areas that are covered under both the MRP and the TMDL. Consistent with the TMDL, MRP Provision C.11.j requires the Permittees to develop an equitable mercury allocation-sharing scheme, in consultation with Caltrans, to address runoff from the Caltrans facilities in the program area.

Caltrans may elect to pursue its own program of mercury load reduction, in lieu of sharing the allocation with the urban runoff management agencies, in which case the Water Board may designate a separate mercury wasteload allocation for Caltrans.

The Permittees are required to report on the status of the efforts to develop this allocation-sharing scheme in the 2010, 2011, and 2012 Annual Reports, and to submit in the 2014 Integrated Monitoring Report the details regarding the manner in which the urban runoff mercury TMDL allocation will be shared between the Permittees and Caltrans.

To comply with this provision, the Permittees are conducting a study with the following objectives:

- Estimate the relative contributions of runoff from Caltrans facilities to urban runoff mercury loadings on an average annual basis within the MRP regulated area,
- Identify any significant temporal or geographical factors that may influence relative proportions of Caltrans vs. MS4 loadings,

- Identify the appropriate share of the TMDL's urban runoff wasteload allocation that is attributable to Caltrans, and
- Engage in a facilitated discussion with Caltrans to identify an equitable allocation-sharing scheme.

As initial steps in this process, BASMAA representatives met with representatives of Caltrans District 4 and Caltrans Headquarters on June 23, 2011, and subsequently exchanged documents relating to pertinent BASMAA and Caltrans activities. A follow-up meeting was held by teleconference on Nov. 3, 2011. Initial discussions have focused on mercury data needs, the potential for collaboration between BASMAA and Caltrans in future mercury monitoring projects, and preliminary work performed to date regarding the estimated proportion of Caltrans contributions to mercury runoff loadings in the SF Bay Area. These initial meetings with Caltrans District 4 have been useful in getting discussions started, and in establishing a willingness of all parties to collaborate on this issue.

In these discussions the parties have tentatively agreed that there may not currently be adequate data to perform the loadings analysis in a way that allows for accurately assigning relative loadings (allocations) to BASMAA vs. Caltrans. Additional monitoring data would be helpful. Caltrans is willing to consider how they can help develop additional data via monitoring beginning under their new permit, either independently or in collaboration with BASMAA.

Stormwater runoff from Caltrans facilities is regulated under a separate, statewide stormwater NPDES permit. An important aspect of the ongoing discussions involves reconciliation by Caltrans of mercury monitoring requirements within the TMDL, the MRP, and the statewide Caltrans NPDES permit. Currently, the Caltrans statewide stormwater permit has not yet been adopted by the State Water Resources Control Board. This has left Caltrans HQ and the District 4 uncertain as to their monitoring and other requirements (incl. TMDL compliance actions). A Second Revised Draft Tentative Order was circulated on April 27, 2012. The public comment period closed on June 26, 2012. A public hearing on the second revised draft order will be held on August 7, 2012.

Based on monitoring data collected over a number of years, Caltrans has developed a mathematical characterization of stormwater discharge quality from highways and other types of facilities under its jurisdiction, through the Caltrans Discharge Characterization Study. Using data from this study, which includes total mercury, Caltrans has prepared preliminary estimates of the relative contributions of runoff from Caltrans facilities to the overall urban runoff mercury loadings in the SF Bay Area.

Meanwhile the Permittees also will be proceeding with the study as described above, with next steps to include preparation by BASMAA of a preliminary estimate of relative loadings. This will be followed by additional meetings involving BASMAA and Caltrans representatives to discuss the BASMAA calculations vs. the Caltrans calculations. At those meetings the parties will negotiate reconciliation of differences in the initial loadings estimations and attempt to agree on an allocation. An initial allocation sharing scheme may be developed on a preliminary basis, subject to refinement with additional data to provide for better loadings estimates. Discussions of the additional

data needs and possible future monitoring collaboration will be considered as negotiations proceed.

PCB CONTROLS

This section includes summaries of regional projects/tasks conducted in compliance with provision C.12 that are not connected to parallel Mercury (C.11) provisions.

C.12.b Pilot Projects to Evaluate Managing PCB-Containing Materials and Wastes during Building Demolition and Renovation (e.g., Window Replacement) Activities

To fulfill MRP requirements in Provision C.12.b, BASMAA continued to work with the regional PCBs in Caulk Project managed by the San Francisco Estuary Partnership (SFEP) and funded by federal stimulus funds (ARRA). The objective was to evaluate the effectiveness of management practices that address legacy caulks containing PCBs as measures to reduce PCB loadings to the Bay. The project:

- Evaluated PCB levels in caulk sampled from Bay Area sites to better understand which types/ages of buildings are most likely to have caulks with PCBs, so that management actions can be targeted effectively.
- Developed potential Best Management Practices (BMPs)and a Model Implementation Process (MIP) to reduce or prevent the release of PCB-laden caulks to the environment during renovation, maintenance and demolition of Bay Area buildings and the subsequent conveyance of the PCB-laden caulks by urban stormwater runoff to San Francisco Bay.

The project concluded at the end of 2011. Final products available on the SFEP web site include:[24]

- Final Report on PCBs in Bay Area Buildings - Sampling Results and Estimate of Loadings to SF Bay
- Excel spreadsheets documenting the basis of the estimated PCB inventory in Bay Area buildings and estimated releases during demolition/renovation
- Best Management Practices
- Model Implementation Process
- Training Strategy
- Technical memorandum on existing regulatory controls and policies related to managing wastes and hazardous materials during building demolition and/or remodeling programs

During FY 2011/12, BASMAA staff continued working with the Project team on implementing the project. The BASMAA staff reported to and received feedback and guidance from the BASMAA Monitoring and POCs Committee. The staff fully participated in all facets of the project, including frequent project teleconferences, development of project work plans, review and commenting on all project

[24] http://www.sfestuary.org/projects/detail.php?projectID=29

deliverables, and a workshop held on July 26, 2011 to perform implementation trials of the recently developed regulatory process to add PCB controls to demolition/renovation permitting. The workshop targeted municipal staff with responsibility for this type of permitting.

C.12.h Fate and Transport Study of PCBs in Urban Runoff

This MRP provision requires Permittees to conduct or cause to be conducted studies aimed at better understanding the fate, transport, and biological uptake of PCBs discharged in urban runoff. The 2009-10 annual report described the specific manner in which Permittees will meet these information needs through the RMP. The RMP Multi-year Plan (see Appendix A9) describes several Strategies to address pollutant-specific information needs and support management decisions through investigation of prioritized Management Questions. During FY 2011-12 the RMP's PCB strategy activities included:

- Revisions to a draft report outlining a conceptual model of transport and food web uptake for mercury and PCBs in Bay Margin areas. Monitoring of mercury, PCBs and other pollutants in biota, both ongoing (Status & Trends) and in a special 3-year study of Small Fish living along the Bay margins that are an important link in the Bay food web (funded 2008-2010).
- Preparation of draft reports on conceptual models of general PCB fate and transport in San Francisco Bay and food web bioaccumulation.

BASMAA representatives will continue participation in RMP Work Groups and Committees to ensure future implementation of studies that meet the MRP's stated information needs, which include understanding the in-Bay transport of PCBs discharged in urban runoff, the influence of urban runoff on the patterns of food web PCBs accumulation, and the identification of drainages where urban runoff PCBs are particularly important in food web accumulation.

COPPER CONTROLS

C.13.c Vehicle Brake Pads

This MRP provision requires Permittees to engage in efforts to reduce the copper discharged from automobile brake pads to surface waters via urban runoff. Provision C.13.c.iii requires that the Permittees report on legislation development and implementation status in Annual Reports during the permit term.

Compliance is being achieved through continued participation in a process originally initiated by the Brake Pad Partnership (BPP). Through their participation in CASQA, Permittees have tracked progress in implementing Senate Bill 346 which restricts the use of several heavy metals and asbestos, and provides for a phase out of copper through

2025 (full text of Chapter 307, Statutes of 2010 was submitted with the FY2010-11 Regional POC Report).

CASQA representatives participated in a January 2012 kick-off meeting held by The Department of Toxic Substances Control (DTSC) to provide an opportunity for initial discussion of needs related to implementation of this new law. Through CASQA, Permittees also commented on preliminary draft regulations prepared to implement similar legislation in Washington State[25]. CASQA representatives' active involvement was essential to ensure that precedents set by Washington will meet California municipalities' needs with regard to:

- Marking and packaging standards for brake pads (manufactured after 2014) to identify which products contain <0.5% copper,
- A compliance verification system for third party testing of brake pads to certify their content.

A CASQA comment letter (Appendix A10) summarizes key outcomes of the discussions regarding Washington State regulations.

C.13.e Studies to Reduce Copper Pollutant Impact Uncertainties

This MRP provision requires Permittees to conduct or cause to be conducted technical studies to investigate possible copper sediment toxicity and technical studies to investigate sub-lethal effects on salmonids. These uncertainties regarding copper effects in the Bay are described in the amended Basin Plan's implementation program for copper site-specific objectives. Compliance will be achieved through continued participation in the RMP, whose Multi-year planning process addresses these gaps through two elements guided by the Exposure Effects Work Group (EEWG):

- A workshop focusing on causes of moderate sediment toxicity in San Francisco Bay will be held in fall 2012. This will be the second in a series of workshops on stressor identification that were recommended by EEWG advisers after review of the limitations of conventional approaches to Toxicity Identification Evaluation. A presentation to the May 2012 EEWG meeting that covers the background and objectives for the workshop is at http://www.sfei.org/sites/default/files/Day1_Item5_Bay_ToxWorkshop.pdf
- A study of the olfactory effects of copper on salmonids in salt water. This study is being completed in 2012. As described in the update in Appendix A11, preliminary tests suggest that copper is less toxic to olfactory physiology in seawater-phase juvenile salmonids than in freshwater. NOAA will confirm these results in an RMP project report for EEWG review in late 2012; additional work on the effects of varying salinity will be conducted in 2013 with non-RMP funding.

[25] SB 346 includes a requirement that California regulations must be consistent with those of other states concerning compliance markings and certification. Washington's brake pad law requires adoption of implementing regulations by December 2012, which is ahead of DTSC's timeline for preparing regulations for SB 346. in June 2012 Washington Department of Ecology issued its proposed Better Brakes rules for public comment, available at http://www.ecy.wa.gov/laws-rules/better_brakes/1017.html

PBDES, LEGACY PESTICIDES, AND SELENIUM

C.14.a Control Program for PBDEs, Legacy Pesticides, and Selenium.

This provision requires the Permittees to work with the other municipal stormwater management agencies in the Bay Region to identify, assess, and manage controllable sources of poly-brominated diphenyl ethers (PBDEs), legacy pesticides, and selenium found in urban runoff. The reporting requirement for 2012 is to report on the results of the following MRP implementation objective:

> Characterize the representative distribution of PBDEs, legacy pesticides, and selenium in the urban areas of the Bay Region covered by this permit to determine:
>
> (1) If PBDEs, legacy pesticides, and selenium are present in urban runoff;
>
> (2) If PBDEs, legacy pesticides, or selenium are distributed relatively uniformly in urban areas; and
>
> (3) Whether storm drains or other surface drainage pathways are sources of PBDEs, legacy pesticides, or selenium in themselves, or whether there are specific locations within urban watersheds where prior or current uses result in land sources contributing to discharges of PBDEs, legacy pesticides, or selenium to San Francisco Bay via urban runoff conveyance systems.

The Permittees' approach to filling these information needs is primarily through BASMAA's participation in the Small Tributaries Loading Strategy (STLS) described in the POC Loads Monitoring section of the Monitoring Status Report (Part B of this Document). The STLS is a collaborative effort between MRP Permittees and the RMP that serves as a framework for monitoring of representative Bay Area watersheds and estimation of regional pollutant loads. Elements of the STLS addressing PBDEs, legacy pesticides, and selenium are described in the work plans for watershed monitoring and the Regional Watershed Spreadsheet Model, contained in Appendices B4 and B4b* of the Monitoring Status Report (Part B of this document). The schedule in these work plans reflects the October 2011 start date for monitoring conducted through a regional collaborative, and the initial characterization results will be reported along with the Urban Creeks Monitoring Report to be submitted in March 2013. If RMP funds are approved to update a previous Conceptual Model Impairment Assessment Report for PBDEs (Appendix A12), the updates will also be incorporated in characterization and source identification results.

* Appendix alphanumeric reference corrected from that in file submitted September 17, 2012.

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PART B

REGIONAL MONITORING COALITION MONITORING STATUS REPORT FOR FEBRUARY-JUNE 2012

INTRODUCTION AND PURPOSE

This status report was prepared on behalf of all towns, cities, counties and flood control agencies (i.e., Permittees) subject to the Municipal Regional Stormwater NPDES Permit (MRP, Order R2009-0074) issued by the San Francisco Regional Water Quality Control Board (Water Board) on October 14, 2009. Provision C.8 of the MRP requires Permittees to conduct water quality monitoring and associated projects during the permit term. In a November 2, 2010 letter to the Permittees, the Water Board's Assistant Executive Officer (Thomas Mumley) acknowledged that all Permittees have opted to conduct monitoring required by the MRP through a regional monitoring collaborative, the Bay Area Stormwater Management Agencies (BASMAA) Regional Monitoring Coalition (RMC). The letter noted that MRP Provision C.8.a.ii allows Permittees participating in the RMC to commence data collection by October 2011 instead of October 2010. The letter also asked that Permittees provide to Water Board staff:

- Status reports on RMC projects and activities by March 15 and September 15 of 2011 and 2012; and,
- A status report and proposed schedule for completing an alternative sampling design(s) and associated multi-year monitoring plan(s) to address Pollutants of Concern and Long-Term Trends Monitoring requirements included in Provision C.8.e, to be submitted no later than March 15, 2011.

Monitoring Status Reports were previously forwarded to Water Board staff on March 15, 2011; September 15, 2011; and March 15, 2012. Additionally, a status report describing alternative sampling design(s) and associated multi-year monitoring plan(s) to address Pollutants of Concern and Long-Term Trends Monitoring requirements was forwarded to Water Board staff on March 15, 2011. This Status Report serves as the final report to the Water Board on RMC projects and activities prior to submittal of electronic monitoring data on January 15, 2013 in compliance with provision C.8.g(ii), and submittal of the *Urban Creeks Monitoring Report* on March 15, 2013 in compliance with provision C.8.g(iii).

BACKGROUND

Regionally-implemented activities in the RMC Work Plan are conducted under the auspices of the Bay Area Stormwater Management Agencies Association (BASMAA), a 501(c)(3) non-profit organization comprised of the municipal stormwater programs in the San Francisco Bay Area. Scopes, budgets, and contracting or in-kind project implementation mechanisms for BASMAA regional projects follow BASMAA's *Operational Policies and Procedures,* approved by the BASMAA Board of Directors (BOD). MRP Permittees, through their stormwater program representatives on the BOD and its subcommittees, collaboratively authorize and participate in BASMAA regional

projects or tasks. Regional project costs are shared by either all BASMAA members or among those Phase I municipal stormwater programs that are subject to the MRP[26].

In February 2011, the RMC developed a Multi-Year Work Plan (RMC Work Plan) to provide a framework for implementing regional monitoring and assessment activities required under MRP provision C.8. The RMC Work Plan summarizes RMC projects planned for implementation between Fiscal Years 2009-10 and 2014-15. Projects were collectively developed by RMC representatives to the BASMAA Monitoring and Pollutants of Concern Committee (MPC), and were conceptually agreed to by the BASMAA BOD. A total of 27 regional projects are identified in the RMC Work Plan, based on the requirements described in provision C.8 of the MRP. The following sections provide brief summaries on progress made by the RMC on approved regional projects that are currently underway or in the planning process. Summaries provided are grouped by sub-provision of MRP provision C.8, which include:

- Compliance Options (C.8.a)
- San Francisco Estuary Receiving Water Monitoring (C.8.b)
- Creek Status Monitoring (C.8.c)
- Monitoring Projects (C.8.d)
- Pollutants of Concern and Long-Term Trends Monitoring (C.8.e)
- Citizen Monitoring and Participation (C.8.f)
- Reporting (C.8.g)
- Monitoring Protocols and Data Quality (C.8.h)

C.8.A COMPLIANCE OPTIONS

Provision C.8.a (Compliance Options) of the MRP allows Permittees to address monitoring requirements through a "regional collaborative effort" (e.g., RMC), their Stormwater Program, and/or individually. In June 2010, Permittees notified the Water Board in writing of their agreement to participate in a regional monitoring collaborative to address requirements in Provision C.8[27]. The regional monitoring collaborative is referred to as the BASMAA Regional Monitoring Coalition (RMC). With notification of participation in the RMC, participating Permittees commenced water quality data collection during the fall/winter 2011. Summaries of monitoring conducted between February 2012 and July 2012 are included in this status report.

C.8.B SAN FRANCISCO ESTUARY RECEIVING WATER MONITORING

As described in Provision C.8.b, Permittees are required to contribute their fair-share financially on an annual basis towards implementing an Estuary receiving water monitoring program that at a minimum is equivalent to the Regional Monitoring Program for Water Quality in the San Francisco Estuary (RMP). During the second part of

[26] The BASMAA programs supporting MRP Regional Projects include all MRP Permittees as well as the cities of Antioch, Brentwood, and Oakley which are not named as Permittees under the MRP but have voluntarily elected to participate in MRP-related regional activities.

[27] The Cities of Antioch, Brentwood and Oakley, and portions of Contra Costa County are not subject to the MRP, but have similar requirements and therefore are participating in the RMC.

FY 2011-12, Permittees complied with this provision by making financial contributions to the RMP directly or through stormwater programs (Table B.1). Additionally, Permittees actively participated in RMP committees and work groups through Permittee and/or stormwater program staff as described in the following sections, which also provide a brief description of the RMP and associated monitoring activities conducted during this reporting period.

Regional Monitoring Program (RMP)

The RMP is a long-term monitoring program that is discharger funded and shares direction and participation by regulatory agencies and the regulated community with the goal of assessing water quality in the San Francisco Bay. The regulated community includes Permittees, publicly owned treatment works (POTWs), dredgers and industrial dischargers. The RMP is intended to answer the following core management questions:

1. Are chemical concentrations in the Estuary potentially at levels of concern and are associated impacts likely?
2. What are the concentrations and masses of contaminants in the Estuary and its segments?
3. What are the sources, pathways, loadings, and processes leading to contaminant related impacts in the Estuary?
4. Have the concentrations, masses, and associated impacts of contaminants in the Estuary increased or decreased?
5. What are the projected concentrations, masses, and associated impacts of contaminants in the Estuary?

Table B.1. Stormwater Program annual contributions to the Regional Monitoring Program for Water Quality in the San Francisco Bay Estuary in 2011 & 2012.

Stormwater Program/Agency	2011	2012
Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP)	$173,934	$174,994
Alameda Countywide Clean Water Program (ACCWP)	$168,592	$167,975
Contra Costa Clean Water Program (CCCWP)	$136,623	$137,317
San Mateo Countywide Water Pollution Prevention Program (SMCWPPP)	$83,602	$83,086
Marin Countywide Stormwater Pollution Prevention Program	$55,507	$55,572
Vallejo Sanitation and Flood Control District	$12,809	$12,717
Fairfield-Suisun Urban Runoff Management Program	$14,697	$14,798
City and County of San Francisco[a]	$38,805	$38,111
California Department of Transportation (CalTrans)[a]	$76,063	$76,063

[a] Although contributors to the RMP under the umbrella of "stormwater", during FY 2011-12, these entities were not members of BASMAA.

The RMP budget is generally broken into two major program elements: Status and Trends, and Pilot/Special Studies. The following paragraphs provide a brief overview of these programs.

RMP Status and Trends Monitoring Program
The Status and Trends Monitoring Program (S&T Program) is the long-term contaminant-monitoring component of the RMP. The S&T Program was initiated as a pilot study in 1989 and redesigned in 2007 based on a more rigorous statistical design that enables the detection of trends. In 2011 the S&T Program was comprised of the following program elements that collect data to address RMP management questions described above:

- Water/Sediment/Biota Chemistry and Toxicity Monitoring
- Sediment Benthos Monitoring
- Small and Large Tributary Loading Studies
- Small Fish and Sport Fish Contamination Studies
- Studies to Determine the Causes of Sediment Toxicity
- Suspended Sediment, Hydrography and Phytoplankton Monitoring
- Bird Egg Monitoring

In fall 2011 the RMP Steering Committee, as part of a 5-year Master Planning process reviewed the S&T Program and agreed to reduce the frequency of some of data collection activities or elements in future years so that more funding will be available for pilot and special studies. Additional information on the S&T Program and associated monitoring data are available for downloading via the RMP website using the Status and Trends Monitoring Data Access Tool at www.sfei.org/rmp/data.htm.

RMP Pilot and Special Studies
The RMP also conducts Pilot and Special Studies (P/S Studies) on an annual basis. Studies usually are designed to investigate and develop new monitoring measures related to anthropogenic contamination or contaminant effects on biota in the Estuary. Special Studies address specific scientific issues that RMP committees and standing workgroups identify as priority for further study. These studies are developed through an open selection process at the workgroup level and selected for funding through RMP committees. Results and summaries of the most pertinent P/S Studies can be found on the RMP website (www.sfei.org/rmp/).

In the first part of 2012, a considerable amount of RMP and Stormwater Program staff time was spent in overseeing and implementing special studies associated with the RMP's Small Tributary Loading Strategy (STLS) and the STLS Multi-Year Monitoring Plan (MYP). Pilot and special studies associated with the STLS are intended to fill data gaps associated with loadings of Pollutants of Concern (POC) from relatively small tributaries to the San Francisco Bay. Additional information is provided on STLS-related studies

under section C.8.e (POC and Long-Term Trends Monitoring) of this Monitoring Status Report.

Participation in Committees, Workgroups and Strategy Teams
In the first portion of 2012 Permittees actively participated in the following RMP Committees and work groups:

- Steering Committee (SC)
- Technical Review Committee (TRC)
- Sources, Pathways and Loadings Workgroup (SPLWG)
- Contaminant Fate Workgroup (CFWG)
- Exposure and Effects Workgroup (EEWG)
- Emerging Contaminant Workgroup (ECWG)
- Strategy Teams (e.g., PCBs, Mercury, Dioxins, Small Tributaries, Nutrients)

Committee and workgroup representation was provided by Permittee, stormwater program staff and/or individuals designated by RMC participants and the BASMAA BOD. Representation included participating in meetings, providing direction to the RMP Multi-Year Plan (see Appendix A9 to Part A of this Report), reviewing technical reports and work products, co-authoring or reviewing articles included in the RMP's *Pulse of the Estuary*, and providing general program direction to RMP staff. Representatives of the RMC also provided timely summaries and updates to, and received input from stormwater program representatives (on behalf of Permittees) during MPC and/or BOD meetings to ensure Permittees' interests were adequately represented.

C.8.C CREEK STATUS MONITORING

Creek status monitoring requirements are described in provision C.8.c, and monitoring parameters, methods, occurrences, durations and minimum number of sampling sites for each stormwater program are listed in Table 8.1 of the MRP. The RMC's regional monitoring strategy for complying with MRP provision C.8.c - creek status monitoring, was completed in FY 2011-12. The strategy, which is described in *Creek Status and Long-Term Trends Monitoring Plan*, includes ambient/probabilistic and targeted monitoring designs. These monitoring designs allow each individual RMC participating program to assess the status of beneficial uses in local creeks within its Program (jurisdictional)area while contributing data to answer management questions at the regional scale (e.g., differences between aquatic life condition in urban and non-urban creeks). The creek status monitoring designs are primarily intended to answer the following core management questions:

1. What is the condition of aquatic life in creeks in the San Francisco Bay Area; are water quality objectives met and are beneficial uses supported?
2. What are the major stressors to aquatic life?
3. What are the long-term trends in water quality in creeks over time?

Table B.2 lists each chemical, biological and physical response and stressor indicators that will be monitored by RMC participants, and the associated monitoring designs and reporting formats.

Table B.2. Summary of RMC creek status indicators, associated monitoring designs and scales of reporting.

Biological Response and Stressor Indicators	Monitoring Design		Reporting	
	Regional Ambient (Probabilistic)	Local (Targeted)	Regional	Local
Bioassessment & Physical Habitat Assessment	X		X	
Chlorine	X		X	
Nutrients	X		X	
Water Toxicity	X		X	
Sediment Toxicity	X		X	
Sediment Chemistry	X		X	
General Water Quality (Continuous)		X		X
Temperature (Continuous)		X		X
Bacteria		X		X
Stream Survey		X		X

Regional Probabilistic and Targeted Designs

In FY 2011-12, RMC participants began implementing a regionally designed receiving water condition assessment to address the first core monitoring question. Two biological response indicators, benthic macroinvertebrates and algae, are primarily used to assess the condition of aquatic life in creeks. These indicators are monitored via an ambient (probabilistic) monitoring design in order to establish a statistically representative understanding of the relative condition of aquatic life in wadable creeks in the RMC area. The number of monitoring sites sampled annually by RMC participants for these parameters (>60) is consistent with Table 8.1 of the MRP. With agreement from Water Board staff, RMC participant sites are distributed among creek reaches with urban (80%) and nonurban (20%) land uses. Region 2 SWAMP is also participating in the regional condition assessment by sampling roughly 10 nonurban sites annually.

In addition to condition assessments described above, stressor assessments will also be conducted by RMC participants in compliance with provision C.8.c. Stressor assessments are intended to address the second core RMC management question,

and depending on the indicator, will either be monitored at bioassessment sites selected via the ambient (probabilistic) monitoring design or at targeted sites selected by RMC participating programs (see Table B.2).

As a complement to the regional probabilistic design, RMC participants are also collecting data consistent with provision C.8.c using a targeted design. Parameters collected using this approach are identified in Table B.2. Using this approach, monitoring sites are selected (targeted) by RMC participants based on locally derived management questions.

Current Status

Based on the implementation schedule described in MRP Provision C.8.a.(ii), creek status monitoring coordinated through the RMC was scheduled to begin in the Fall/Winter of 2011 with water toxicity testing during one storm event. Due to the limited number of storms between October and December 2011, storm event monitoring was completed in early 2012. Bioassessment monitoring to support condition assessments, and physical habitat, chlorine, and nutrient monitoring to support stressor assessments were completed during late spring and early summer 2012 by all participants and SWAMP. RMC participating programs also successfully completed dry weather water and sediment toxicity, sediment chemistry, and pathogen indicator (bacteria) monitoring in July 2012. Continuous temperature and water quality monitoring were also completed consistent the time schedules in MRP table 8.1. Stream surveys are currently beginning or underway by RMC participants. A full implementation schedule for RMC creek status monitoring is included as Table 7 in Appendix B1.

Standard Operating and Data Quality Assurance Procedures

In parallel with the RMC creek status monitoring plan development, the RMC also developed RMC-specific Standard Operating Procedures (SOPs) and a Quality Assurance Project Plan (QAPP) through a regional project. These documents are consistent with the existing SWAMP QAPP and build upon SWAMP SOPs. Draft final versions of the RMC's QAPP and SOPs have been completed. These documents have been developed in coordination with Region 2 SWAMP staff to allow standardization among RMC participants and related regional SWAMP activities.

Creek Status and Trends Information Management System Development

RMC participants are currently developing a regional RMC creek status and trends information management system (i.e., database) as a BASMAA regional project. A draft Information Management System Work Plan was created in 2011 to guide database development and information sharing and management roles and options for database platforms are currently being reviewed by RMC participants. Database development will begin in the spring 2012 and an initial version of the RMC database will be completed by fall 2012. The database will be used individually by each RMC participating program to house, query and export their own creek status monitoring

data. Exporting capabilities will assist each program in generating electronic data submittals in SWAMP comparable formats.

C.8.D MONITORING PROJECTS

Three types of monitoring projects are required by provision C.8.d of the MRP: 1) Stressor/Source Identification (C.8.d.i); 2) BMP Effectiveness Investigation (C.8.d.ii); and, 3) Geomorphic Project (C.8.d.iii). These projects are generally described in the RMC Work Plan. Based on MRP compliance schedules for these Provisions, the Permittees' focus during the second part of FY 2011-12 was on scoping future collaborative RMC projects for Stressor/Source Identification. To ensure consistency in interpretation of the Stressor/Source ID requirements (C.8.d.i) and a coordinated approach to compliance with that provision, the RMC initiated a regional project to develop Stressor/Source Identification Guidance, planned for completion in 2012. The guidance is being organized to respond to the triggers listed in MRP Table 8.1 and will focus on the initial follow-up actions required by provision C.8.d.i. Components of the Guidance include identifying the geographical and temporal extent of the trigger exceedance, compiling all available data and information on the trigger that was exceeded, investigating whether a known source or stressor is implicated, and determining whether a Toxicity Identification Evaluation, Toxicity Reduction Evaluation or other follow-up investigation is warranted.

Three stressor/source ID projects have been initiated by the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP). SCVURPPP completed data analyses for stressor/source identification in Coyote Creek and Stevens Creek, and conducted an additional monitoring study in Guadalupe River and Alviso Slough in FY 2011-12. Monitoring and analyses for these projects were conducted in compliance with provision C.8.d(i). Interim reports for the Coyote Creek and Guadalupe River stressor/source ID studies are included in SCVURPPP's FY 2011-12 Annual Report. A summary of monitoring completed to-date in Stevens Creek was included in the FY 2010-11 SCVURPPP Annual Report.

C.8.E POLLUTANTS OF CONCERN AND LONG-TERM TRENDS MONITORING

POC Loads Monitoring

Pollutants of Concern (POC) loads monitoring is required by provision C.8.e(i) of the MRP. Loads monitoring is intended to assess inputs of POCs to the Bay from local tributaries and urban runoff, assess progress toward achieving wasteload allocations (WLAs) for TMDLs, and help resolve uncertainties associated with loading estimates for these pollutants. In particular, there are four priority management questions that need to be addressed though POC loads monitoring:

1. Which Bay tributaries (including stormwater conveyances) contribute most to Bay impairment from POCs?
2. What are the annual loads or concentrations of POCs from tributaries to the Bay?

3. What are the decadal-scale loading or concentration trends of POCs from small tributaries to the Bay? and,
4. What are the projected impacts of management actions (including control measures) on tributaries and where should these management actions be implemented to have the greatest beneficial impact?

To assist participants in effectively and efficiently conducting POC loads monitoring required by the MRP and answer POC loads management questions listed above, an RMP Small Tributaries Loading Strategy (STLS) was developed in 2009 by the STLS Work Group, which includes representatives from BASMAA, Water Board staff, RMP/SFEI staff and technical advisors. The objective of the STLS is to develop a comprehensive planning framework to coordinate POC loads monitoring/modeling between the RMP and RMC participants. This framework and a summary of activities and products to date are provided in the STLS Multi-Year Plan (STLS MYP). With concurrence of participating Water Board Staff, the STLS MYP presents an alternative approach to the POC loads monitoring requirements described in MRP Provision C.8.e.i, as allowed by Provision C.8.e. The initial Version 2011 of the STLS MYP, along with several of its appendices, was appended to the RMC's September 2011 Monitoring Status Report. Major elements of the STLS MYP are summarized below and the updated Version 2012B is included as Appendix B4 of this Status Report

RMC participant activities associated with POC loads monitoring during the second part of FY 2011-12 focused on monitoring implementation, coordinated through the STLS Work Group and the associated RMP Sources Pathways Loadings Work Group (SPLWG).

STLS Multi-Year Plan activities

Based on the consensus of the STLS Work Group, The STLS MYP is intended to assist Permittees in complying with provision C.8.e (POC Monitoring) through an alternative POC monitoring program than the one described in the MRP. The MYP is designed to address the four core POC loads monitoring management questions, while integrating activities funded by Permittees, via the BASMAA RMC, with those funded by the RMP. The STLS MYP provides a more comprehensive description and workplan for STLS activities over the next 5 to10 years, including a detailed rationale for the methods and locations of proposed activities (e.g., POC loads monitoring in small tributaries).

The MYP includes four main elements that work together to address the four management questions:

- Watershed modeling of runoff, pollutants and sediment discharged to San Francisco Bay, using the Regional Watershed Spreadsheet Model (RWSM);
- Bay Margins Modeling;
- Source Area Runoff Monitoring; and,
- Small Tributaries Monitoring in local watersheds

The following paragraphs provide brief summaries of each of these elements and activities conducted during the period from February through June 2012:

Watershed Modeling –With oversight by the STLS and Sources Pathways Loadings Work Group, RMP staff produced reports documenting the initial construction and testing of the RWSM, which will be the primary tool for estimation of overall POC loads to San Francisco Bay[28]. In March 2012 the STLS Work Group agreed on a five-year work plan (see Appendix B4b) for developing and completing the RWSM for the following attributes or pollutants:

- Hydrology
- Suspended Sediment
- PCBs, mercury and copper
- Selenium, PBDEs and organochlorine pesticides.
- Dioxins and Nutrients

While a similar process is used to develop the model for each of the above, there will be differences in the model structures to reflect differing conceptual models of spatial occurrence and transport in runoff. In FY 2011-12, RWSM efforts focused on refinements to the basic runoff model coefficients and calibration of the hydrological performance of the model.

Bay Margins Modeling – The RMP is in the process of developing a Bay Margins Conceptual Model as part of a separate Bay Modeling Strategy overseen by the RMP's Contaminant Fate Work Group. The goals of the modeling strategy with regard to PCBs and mercury include identification of high-leverage watersheds whose POC loadings contribute disproportionately to Bay impacts. Further development of the Bay Modeling Strategy is planned to occur in FY 2012-13, subject to modifications to the RMP's Multi-Year Plan (Appendix A9) directed by the RMP Steering Committee.

Source Area Runoff Monitoring – This element of the STLS is intended as a placeholder for studies to develop Event Mean Concentrations (EMCs) of POCs to parameterize the RWSM. On the advice of the SPLWG, current RMP studies are exploring alternative approaches to back-calculating EMCs from available sediment, as a cost-effective way to support initial testing of the RWSM and help determine priorities for field-data collection (see Appendix B4b).

Small Tributaries Watershed Monitoring – Monitoring for Water Year 2012[29] was conducted at four stations that were set up and mobilized at the bottom of selected watersheds for small tributary loads monitoring beginning in October 2011. Responsibilities for station setup and field operations were divided between the RMP and contractors for BASMAA programs, provided as in-kind contributions to a RMC regional project for cost-sharing purposes (see Table B.3). Monitoring methods and

[28] RWSM Year 1 and Year 2 reports are respectively at http://www.sfei.org/sites/default/files/RWSM_EMC_Year1_report_FINAL.pdf and http://www.sfei.org/sites/default/files/RWSM_EMC_Year2_report_FINAL.pdf

[29] Each Water Year runs from October 1 through September 30 of the following year, corresponding to the time period for one year of monitoring reporting as specified in MRP C.8.h.

laboratory analyses according to the descriptions in the STLS MYP are being documented through a BASMAA regional project that has drafted a Field Manual and Quality Assurance Project Plan, while another regional project contracted with SFEI to provide laboratory analyses, data management and data quality assurance to ensure data consistency among all watershed monitoring stations.

Table B.3. Existing or planned Watershed Monitoring Stations for the Small Tributaries Loading Strategy.

Station Name (County)	Funding source WY2012 [a]	Funding source WY2013 [a]
Lower Marsh Creek (Contra Costa County)	CCCWP in-kind	CCCWP in-kind
San Leandro Creek (Alameda County)	RMP [b]	ACCWP in kind
Guadalupe River - (Santa Clara County)	SCVURPPP in-kind (SFEI contract)	SCVURPPP in-kind
Sunnyvale East Channel (Santa Clara County)	RMP	RMP
North Richmond Pump Station (Contra Costa County)	N/A	RMP
Pulgas Creek Pump Station [c] (San Mateo County)	N/A	SMCWPPP in-kind

[a] BASMAA funding is provided on a FY basis beginning July 1 prior to start of the WY, while RMP funds are allocated on a calendar year basis beginning the January 1 after start of the WY.
[b] Funding for equipment purchase and station set-up by ACCWP.
[c] One of two incoming channels - see text.

Due to a very dry WY 2012, fewer than the planned number of storm events were sampled at 3 of the first 4 stations. With concurrence of Water Board staff, the STLS Work Group agreed that additional samples would be added to WY 2012-13 sampling plans so that over a 3-year period, a total of 12 representative storm events will be sampled at stations that were established in WY 2012. A lessons-learned document, with suggested recommendations for improvements in future monitoring procedures, will be developed during fall 2012 and applied to WY 2013 sampling. Data collected at monitoring sites in WY 2012 will be submitted electronically the Water Board by January 15, 2013. A POC Monitoring Field Manual and Quality Assurance Project Plan will be finalized in FY 2012-13 and submitted with the Urban Creeks Monitoring Report in March 2013.

Table B.3 also shows two additional stations where monitoring will be initiated in WY2012-13. Both are at stormwater pump stations in older urban areas where future management actions are likely, as described under Joint Mercury and PCBs Controls in

the Regional POC Report (Part A of this document). At the Pulgas Creek Pump Station, one of two main incoming drainage lines will be monitored by SMCWPPP as an STLS effort, while the other will be sampled for one season using a similar monitoring approach as part of SMCWPPP's diversion pilot project to address MRP requirements in C.11/12.f.

Long-Term Trends Monitoring

In addition to POC loads monitoring, Provision C.8.e requires Permittees to conduct long-term trends monitoring to evaluate if stormwater discharges are causing or contributing to toxic impacts on aquatic life. Required long-term monitoring parameters, methods, intervals and occurrences are included as Category 3 parameters in Table 8.4 of the MRP, and prescribed long-term monitoring locations are included in Table 8.3. Similar to creek status and POC loads monitoring, long-term trends monitoring was scheduled to begin October 2011 for RMC participants.

As described in the *RMC Creek Status and Trends Monitoring Plan* (Appendix B1), the State of California's Surface Water Ambient Monitoring Program (SWAMP) through its Statewide Stream Pollutant Trend Monitoring (SPoT) Program currently monitors the seven long-term monitoring sites required by Provision C.8.e.ii. Sampling via the SPoT program is currently conducted at the sampling interval described in Provision C.8.e.iii in the MRP. The SPoT program is generally conducted to answer the management question:

- What are the long-term trends in water quality in creeks?

Based on discussions with Region 2 SWAMP staff, RMC participants are currently complying with MRP provision C.8.e via monitoring conducted by the SPoT program. This manner of compliance is consistent with the MRP language in provision C.8.e.ii. In FY 2011-12, RMC representatives coordinated with the SPoT program on long-term monitoring to ensure MRP monitoring and reporting requirements were addressed[30]. Recent discussions with SPoT program managers indicate that they are developing an interpretative monitoring report. Permittees will continue to track the timeline for SWAMP reporting of SPoT results.

Sediment Delivery Estimate/Budget

Provision C.8.e.(vi) of the MRP requires Permittees to develop a design for a robust sediment delivery estimate/sediment budget in local tributaries and urban drainages, and implement the study by July 1, 2012. The purpose of the sediment delivery estimate is to improve the Permittees' ability to estimate urban runoff contributions to loads of POCs, most of which are closely associated with sediment. To determine a strategy for a robust sediment estimate/budget, RMC representatives reviewed recent sediment

[30] MRP Provision C.8.a.iv "Third Party Monitoring" states that where an existing third-party organization has initiated plans to conduct monitoring that would fulfill one or more requirements of Provision C.8 but the monitoring would not meet MRP due date(s) by a year or less, the Permittees may request that the Executive Officer adjust the due date(s) to synchronize with such efforts.

delivery estimates developed by the RMP, and determined that these objectives will be met through sediment-specific modeling with the RWSM. Therefore, the implementation of the sediment delivery/budget study will occur in coordination with other RWSM activities as described in Appendix B4b, where the BASMAA-funded sediment work will also enhance the model development for PCBs and other sediment-bound POCs.

Emerging Pollutants Work Plan

In compliance with Provision C.8.e.v, Permittees are required by March 2014 to develop a work plan and schedule for initial loading estimates and source analyses for the following emerging pollutants: 1) endocrine-disrupting compounds; 2) PFOS/PFAS (Perfluorooctane Sulfonates (PFOS); 3) Perfluoroalkyl Sulfonates (PFAS); and, 4) NP/NPEs (nonylphenols/nonylphenol esters —estrogenlike compounds). The intent of the work plan is to begin planning for implementation during the next permit term (i.e., post December 2014). Because the compliance date for completion of this work plan is in the future, only initial discussions of the scope of this project were conducted by the RMC participants during this reporting period. BASMAA representatives to the RMP will coordinate efforts with the Emerging Contaminants Strategy being developed under the oversight of the Emerging Contaminant Work Group. As described in Appendix B5, consideration of recent studies and data may lead to recommendations for updates to the strategy's prioritization of various emerging contaminants and recommendations for future monitoring in San Francisco Bay.

C.8.F CITIZEN MONITORING AND PARTICIPATION

Participants of the RMC, to varying degrees, currently coordinate with or support citizen monitors and watershed groups within their geographical areas. As a result, relationships have been developed between RMC participants and citizen monitors. In FY 2011-12, RMC participants began sharing information and ideas about varying approaches to encourage citizen monitoring and seek out stakeholder participation and comment at MPC meetings. The variety of potential or planned activities discussed by various Programs and Permittees include:

- encourage citizen input via interactive website
- fund volunteer monitoring through grants to groups
- provide direct assistance to citizen monitoring efforts
- compile information on various citizen monitoring efforts for incorporation in annual reports

C.8.G REPORTING

Provision C.8.g requires Permittees to report annually on water quality data collected in compliance with the MRP. Annual reporting requirements include: 1) water quality standard exceedances; 2) creek status monitoring electronic reporting; and, 3) urban creeks monitoring reporting. For RMC participants, annual reporting requirements begin in January 2013 for electronic data submittals and March 2013 for interpretive reporting (i.e., Urban Creeks Monitoring Reports), for monitoring conducted from October 2011

through September 2012. Therefore, reporting of water quality monitoring data collected in compliance with Provision C.8 is not required in this Status Report.

In the second half of FY 2011-12, RMC participants began outlining the Urban Creeks Monitoring Report due to the Water Board by March 15, 2012. Consistent with RMC monitoring designs (see Table B.2), participants will be collectively developing a single *Regional Urban Creek Urban Creeks Monitoring Report* that will report on parameters collected via the regional probabilistic design. Additionally, each RMC participating program will develop a *Local Urban Creeks Monitoring Report* that will include interpretations of targeted monitoring.

C.8.H MONITORING PROTOCOLS, DATA QUALITY AND DATA MANAGEMENT

Provision C.8.h requires that water quality data collected by Permittees in compliance with the MRP should be of a quality that is consistent with the State of California's Surface Water Ambient Monitoring Program (SWAMP) standards, set forth in the SWAMP Quality Assurance Project Plan (QAPP). To assist Permittees in meeting SWAMP data quality standards and developing data management systems that allow for easy access of water quality monitoring data by Permittees, the RMC made significant progress on the following regional projects during this reporting period:

- Standard Operating and Data Quality Assurance Procedures – Two projects designed to address monitoring protocols and data quality requirements described in Provision C.8.h were approved by the BOD in FY 2009-10 and continued through FY 2011-12. The first entails the development of a new field manual and quality assurance project plan (QAPP) for POC loads monitoring coordinated through the STLS Work Group and described in the MYP (Appendix B4). Version 1 of the Field Manual and QAPP will be completed in FY 2012-13 after incorporating revisions in field procedures based on STLS Work Group review of the experiences and lessons learned in FY 2011-12. The second project adapted the existing creek status monitoring SOPs and QAPP developed by SWAMP to document the field procedures necessary to maintain comparable, high quality data among RMC participants. Final draft deliverables (Appendices B2 and B3) are complete for purposes of field data collection and will be updated later in FY 2011-12 after final coordination with the Creek Status Monitoring Information Management System described below.

- Information Management System Development/Adaptation – As described in the RMC Work Plan, RMC participants would like to store and manage water quality data collected in compliance with Provision C.8 in a cost effective manner that provides data users easy access. In the second half of FY 2011-12 the RMC continued two regional projects designed to develop POC Monitoring and Creek Status and Trends Information Management Systems (IMSs) for use by the RMC. The goal of these projects is to provide standardized data storage formats, thus providing a mechanism for sharing data among RMC participants.